The Builder.

Vol. LVI. No. 2892. SATURDAY, MARCH 5, 1889.

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More about the Monumental Chapel Scheme.

IN another column we print two letters from architects in reference to the proposed addition of a monumental chapel to Westminster Abbey, embodying very opposite views on the subject. The current number of the *Nineteenth Century* contains two short articles, one by Mr. William Morris, the other by Mr. Knowles, the editor of the magazine, which are, if that be possible, still more opposite to one another. All of these, however, may be taken as typical of the views of various cliques, each of which is desirous to have its say on a subject of such national interest as a proposal to add to or in any way touch Westminster Abbey; and, though many of the remarks that are being made are impracticable and one-sided in their nature, they are mostly of use as suggesting various views on the subject, for each of which something may be said.

Mr. William Morris writes in the capacity of Honorary Secretary of the Society for the Protection of Ancient Buildings. A scheme closely involving the welfare of Westminster Abbey and its precinct "must," he says, "be of extreme interest to the Society for the Protection of Ancient Buildings; and it is the duty of that Society to criticise it without fear or favour"; a duty which that Society, we need not doubt, thoroughly enjoys. It is to be feared, however, that the truly faithful among the "Anti-Scrapes" will not entirely approve of their Honorary Secretary's article, since he falls into the unwonted weakness of attacking and speaking disrespectfully of monuments which are, and have been for some time, in existence. Mr. Morris is eloquent in regard to the Abbey itself, no doubt; he flourishes with the usual fervour that adverb "surely," which is one of the literary ensigns of the writers of his clique: "Such a building should surely be sacred to us; surely nothing should be touched in it, no work should be undertaken in it without the necessity being made clear by the gravest deliberation of the skilfullest and honestest person among us," &c. But when we come to monuments in the church, there is by no means the orthodox worship of the past to be recognised. Mr. Morris divides the monuments into two sections, those in which the original architecture of the building has been considered, and those in which it has been ignored. The former, according to Mr. Morris's classification, are tolerably harmless, and there were official and other reasons to account for the burial in the church of those whom they commemorate. For the others no name is bad enough, and they seem as if placed for the express purpose of insulting the original architecture of the church as coarsely as possible, "but, of course, their producers never attained to such a pitch of intelligence as that." This is not too much to say of many of them; but then what becomes of the principles of the Society for the Protection of Ancient Buildings, according to which (as repeatedly put forth in their circulars) anything which is a relic of the taste and predilections of a past generation is *ipso facto* sacred? The Society would, no doubt, have prevented the erection of many of the eighteenth-century monuments if it had existed in that day; but, according to its own principles, as repeatedly set forth and illustrated in its annual reports, when the monuments had once been placed there, the Society should have been equally anxious to preserve them as illustrations of the temper and taste of the generation which erected them. As far as this goes, Mr. Morris is evidently recalcitrant; he is no sound member of the Guild which he represents; he has been betrayed into speaking scoffingly of monuments more than a century old, and we shall be much surprised if he is not called to account for this heresy at the next annual meeting of the Society. In his scoffs at the monuments themselves we should be in sympathy with him, however; but Mr. Morris sneers also in a very unnecessary manner at the feeling which gave rise to them:—

> "They represent, not the natural, quiet course of sepulture in a famous church, a great centre of civil and ecclesiastical administration, but a new piece of conventional pedantry, the growth of the period between the Middle Ages and Modern times, much akin to the creation of academies for the living, which was a process of the same period; in short, they are a privileged class of memorials of the privileged dead. From the end of the seventeenth or beginning of the eighteenth century it has come to be a custom of our nation that anyone who could acquire a certain degree of *respectable* notoriety might put in a claim to burial and commemoration in Westminster Abbey as a final privilege, a last honour accorded by a grateful nation to his energy and self-assertion."

In regard to the interments of recent days, this cynical, ill-natured sneer seems to us in as bad taste and as uncalled for as anything well could be. The first names that occur to us of those who have been buried in the Abbey of late years are Sterndale Bennett and Darwin, two as typical specimens of the modest, simple-minded unostentatious man of genius as could well be named. The remark might be applied to the eighteenth century interments with a certain amount of truth, perhaps, but it is untrue now; there is no competition to be buried in Westminster Abbey. It is an honour conferred by the nation on those who have deserved well of their country, and it may be doubted whether Mr. Morris, by no means himself one of the humblest or most reticent men of his generation, will find his own "self-assertion" rewarded in the same manner.

The argument, however, as continued by Mr. Morris, is that there should be no more monuments allowed in the Abbey; as there is no more room, why not give up the farce, "and put an end to the strange experiments in ugliness under which the Abbey has so long suffered?" We presume Mr. Gilbert's monument to Fawcett is one of these "experiments in ugliness," an opinion which would be hardly more unreasonable than the conclusion of the previous sentence, that "the busts produced by modern sculpture are not quite congruous with the architecture of people who knew how to carve." No, they are not, for they represent a greater knowledge of the figure and a greater power of modelling than any Mediæval sculptor possessed; the incongruity is only in that sense. Mr. Morris's cynicism, however, may be of use in suggesting one view of the question, viz., is a monumental chapel in connexion with the Abbey desired by the majority of people at all? Is it the same thing to any one as burial in the Abbey? The latter question Mr. Morris does not touch; but assuming, for the sake of argument, that people do wish to have room to continue this "curious habit" of memorials to "successful competitors," he objects to any building for this purpose having any connexion with the Abbey at all, of course on the ground that such a building cannot be connected with the Abbey except by means of some structural alteration in the ancient building, a proceeding which, we need not say, would be held in abhorrence by the Society which he represents. We do not share Mr. Morris's views in this respect, but we cannot help thinking that he is pretty near the truth when he says, after objecting (on the same grounds that Mr. Clarke does) to

placing the proposed chapel on the site of ancient remains of the Abbey buildings:—

"But the chapel thus placed on this objectionable site, Mr. Lefevre finds it necessary to make a passage from the Abbey-church into it, so as to claim for it the quite false position of its being a part of the Church. This said passage, of course, blocks up the side of the Chapter-house and its buttresses, and cuts off a huge cantle of Poet's Corner, and would be altogether an awkward and injurious addition to the Abbey."

So far as that sentence goes, we are quite with Mr. Morris; the proposed method of connecting the new building with the old would undoubtedly, as we have already said, be clumsy and unarchitectural, and would spoil the appearance of the Chapter-house; and it is equally true that a new building reached in such a manner from the Abbey would never be felt by any one to be a part of the Abbey; it is a mere make-believe to think so. If the new chapel cannot be made a more integral part of the Abbey than that, we are disposed to agree with Mr. Morris that it would be more sensible, if we keep up a system of public national funeral honours, to build a monumental hall quite independent of the Abbey, and standing for what it is,—a modern monumental hall, and not a pretence of being part of an ancient building.

Mr. Morris seems to assume that in that case there would still be some kind of suitability in placing the hall in the near neighbourhood of the Abbey, and suggests the Abingdon-street site; but in reality, if direct connexion with the Abbey is once given up, contiguity to it is no special object. The land to the south of the Houses of Parliament, which we have already suggested, is a much finer site, if the thing were to be done in a manner worthy of the nation. Mr. Morris has reason in his suggestion that the building should not in any way suggest a chapel, having in view the fact (which is undeniable) that some of the competitors may have held opinions, which may be shared by their surviving friends, at variance with the sentiment that attaches to a building having the resemblance of a church. Mr. Somers Clarke, on the other hand, very naïvely remarks that "being Englishmen, we do not want Campo Santos, Pantheons, and such outlandish things"; an outbreak of inherent John-Bullism which is touching, if illogical.

Mr. Somers Clarke's proposition for a building on the site proposed by Mr. Shaw Lefevre, but only covering the portion not occupied by any remains of Mediæval buildings, is reasonable and worth consideration from his point of view; and his suggestion that a building placed east and west is superior for effect of light to one running north and south, is not to be overlooked. But this scheme includes the idea of direct connexion with the Abbey, and it is very difficult to see how this is to be achieved with success from an architectural point of view. The method of having an aisle winding under a portion of the flying buttresses of the Chapter-house, which he seems to tacitly accept, is bad in two senses. For the object of connexion with the Abbey, of making the new chapel practically a part of the Abbey, it is not direct enough; the access would be an undignified and ineffective one, and the connexion with the Abbey, if that object is considered as of primary importance, is not close enough. No one could regard a chapel so approached as forming a part of the Abbey-church: it is an appendage reached by a kind of back passage,—and externally it is certain that such a method of communication must have a bad effect architecturally. The appearance of the Chapter-house would be spoiled by it. The only method of juncture which would produce a satisfactory external effect would be to make the Chapter-house the vestibule to the chapel, and place the latter east and west on the axis of the Chapter-house, and parallel with Henry the Seventh's Chapel. This might have a fine effect *externally*, especially if the new chapel were treated with a richness of detail corresponding with that of Henry the Seventh's Chapel; not, of course, in imitation of it, but with the same degree of elaboration. This, however, could only be regarded as a possible solution as far as concerns exterior effect. It would be necessary to destroy the unity of design of the Chapter-house by breaking an arch through its eastern face, and to falsify the proper function and meaning of the Chapter-house itself; but we are unable to see any other way of connecting the new building satisfactorily with the old in an architectural sense, as far as external effect is concerned.

We now come to Mr. Knowles's short article, a great contrast, in its common-sense language and practical character, to the effusions of Mr. Morris. Mr. Knowles's idea is the same which we suggested a fortnight ago, and it is very well put and without a superfluous word. The two main arguments on which it is based we may give in Mr. Knowles's own words:—

"A substitute for Westminster Abbey might *grow*, in the course of another thousand years, but it could not be *made*, and until every existing opportunity has been exhausted would evoke no sympathy or enthusiasm.

Beyond the objection of the great expense (estimated at 140,000*l.*) of any new edifice, and the equally great objection that monuments in a new building, quite distinct from the Abbey, and devoid of any sort or kind of association with it, would have small interest or attraction for anybody, comes the capital objection that it is unnecessary; for the Abbey itself, in one of its most exquisite and most ancient portions, can still afford abundant space."

The suggestion is to place future statues, tablets, busts, or other monuments, in the cloisters, which, as Mr. Knowles says, form an integral portion of the original fabric, and are directly connected by two doors with the nave of the church. At first he would propose that the north and east aisles only, which are the most closely incorporated with the Abbey, might be filled; "but they would give sufficient space for a hundred years." The Chapter-house, which opens from the east walk of the cloisters, might also receive memorials, to the great addition of its architectural effect, and certainly not unsuitably in any other respect. Mr. Knowles adds another consideration: that the cloisters are now in such a state that some expenditure on them before long is necessary, if they are to be preserved from ruin.

"Finally, in the green-swarded square framed by the cloisters would be abundant space for all the actual interments of great men which might become necessary. There, in the very heart of London and of the Empire, they would lie under grass as green as in the quiet of a country churchyard, and surrounded on every side by the most majestic memories in the world.

All this may be the future of the cloisters, and for a sum which, if included in the Estimates for their preservation, would almost certainly be obtained at once from a unanimous House of Commons."

This is admirably put; and, moreover, we believe the conclusion expressed in the last sentence is well founded. There would be little doubt of the money required being voted.

There is one objection, which has been urged already: that the cloister walls are now occupied with a certain number of memorial tablets; and we think Mr. Knowles must plead guilty, with ourselves, to having rather overlooked the extent to which this is the case. Most of these are comparatively small and placed high up, and they do not obtrude themselves much on the notice of the passer-by unless attention is specially directed to them; but nearly every bay is occupied with one, and to remove them would be a kind of impiety. But the obstacle is not so insuperable as may at first sight appear. There is a large amount of space below them and between them*; and we have in recent days learned the lesson that monuments, to be beautiful and appropriate, need not be of large size and obtrusive character. In regard to the south walk of the cloister, Mr. Somers Clarke's objection holds good; it is a thoroughfare to various dwelling-houses within the precinct. But the objection does not, to our mind, apply to the west walk, which is an access to the church; there is nothing out of keeping in placing monuments in such a situation.

We may conclude with a reference to one or two other points in connexion with the subject. The remark in Mr. Clarke's letter, that "the Little Cloister, with its view of the Victoria Tower, would be entirely ruined" by Mr. Shaw Lefevre's large building rising close against the eastern side of it, is strictly true. As he says, the houses that were not demolished by it would be hardly habitable, with the wall of the great building rising above and stopping out all the light; and if it be thought that the view of the Victoria Tower from this cloister is not a thing worth preserving, we should recommend those who think so to go and look at it again. It is one of the most remarkable architectural effects to be seen anywhere in London, and it would be a thousand pities to lose it.

Another consideration in regard to the building of a very large monumental chapel, such as has been proposed, should not be overlooked. People would never be satisfied to see it stand long empty and unadorned; and an almost certain consequence would be that great men would be invented, as fast as possible, to fill the chapel with monuments. There would be a kind of rush to be buried there, and what ought to be a perfectly exceptional honour would become a cheap and commonplace one. There is little doubt that the judicious caution which has been exercised generally of late years in regard to the honour of interment in the Abbey has been brought about partly by the fact that the available space has become so small. It has been felt that where so few could now find place, those few must be those of whose worthiness for the honour there can be no question or difference of opinion. Had there been the same scarcity of space in the eighteenth century, many of the now obscure persons who are commemorated would never have found a resting-place in the Abbey, nor would even the more eminent have been permitted such large and cumbrous monuments. With the building of a monumental chapel larger than the present nave this wholesome material restriction would be removed, and we should have a string of big monuments over again. In the cloisters, the taste both of the artists who should design the memorials and of the friends who should influence their erection would be necessarily impelled in the direction of reticence and simplicity, of monuments remarkable for their artistic finish and expressiveness rather than for their size and pretension; and it may be safely said that there would be few indeed among those great spirits who might have claim to be commemorated in Westminster Abbey who would not prefer to think of a tablet within the walls of the cloister hallowed by historic memories, rather than of the most sumptuous tomb in a modern building having no link with the past and no association with the England of ancient times.

* Mr. Somers Clarke, we observe, in his desire to find arguments against the scheme, and in favour of his own, asserts that the walls of the cloister are "encrusted with tablets"; a ridiculous exaggeration.

THE FORTH AND CLYDE SHIP CANAL SCHEME.

In the *Builder* of September 6, 1884, the feasibility of a ship canal across Scotland at its narrowest neck was very fully discussed, and conclusions arrived at which at least were not inimical to a project of the kind. At that time and on to the close of the year the scheme engaged public attention in no inconsiderable measure; but nothing came of it, and ultimately the discursive attention of the country was carried off by some other passing attraction. Within the past few months there has been a revival of interest and speculation, this time displayed over a field which is distinctly wider, and with, of course, as part of the outcome, much inconsequent deliverance of the dilettante sort to which no attention need be paid.

The Forth and Clyde Isthmus may be

described in brief as a continued transverse depression, rather than anything of the nature of a ridge, a depression which, within a not very remote geological period, actually gave tidal passage to the waters of the sea. From the deepened Clyde to the open navigable waters of the Forth, the distance on the shortest section is about twenty-five miles, following, as it so happens, pretty closely the base line of the depression named. A century ago the shortest track across from deep water to deep water extended to very nearly double that distance, viz., from off the mouth of the Leven, at Dumbarton Castle Rock, to low water mark on the Firth of Forth, at the port of Borrowstouness; but the Clyde has since been deepened up to Glasgow on the scale of a ship canal of the first class, while the sea outfall works of the modern port of Grangemouth, on the east, have been carried out on a scale hardly less promising. By the approximation of these two independent undertakings, the one on the west and the other on the east, the practical breadth of the isthmus has been reduced to twenty-five miles, starting from the Clyde on the western outskirts of Glasgow, and striking the partially indrawn Forth waters at Grangemouth. The position might be laid down in even more favourable terms. At Grangemouth, from the west, the river Carron enters the waters of the eastern estuary. The Carron is navigable for a few miles from its mouth, up as far as the well-known and almost ancient works of the Carron Iron Company. This strip of inland navigation is short, certainly, extending to only two or three miles at the most, and its depth at present admits vessels of only a moderate draught; but, unquestionably, in any scheme for cutting the isthmus it could be worked in to very great advantage, simply by enlarging its dimensions to the extent required, so as to bring it about on a par with the western entrance of the new work, consisting of the deepened channel of the Clyde. Considering, then, the comparative shortness of the track to be excavated, thus reduced to little more than twenty miles; the very flat and low-lying character of the eastern flank of the isthmus, which for some distance inland beyond the Carron Ironworks and past the parallel of Falkirk is made up of an easily-worked sedimentary deposit, elevated but a few feet above high-water mark; and considering, no less, the very moderate summit level of the central portion of the crossing valley, it would appear to be scarcely worth the while of engineering resource, or the enterprise of capital, to undertake the work unless to carry it through on the scale of a clean tidal cut like that of the Suez Canal, thereby dispensing for all time with the burden, the risk, and the perennial annoyance of a locked navigation with multiple levels. Engineering operations would be conducted under comparatively favourable conditions as to cost, having within reach several centres of plant and labour supply. The land, for the most part, is of poor value, and, owing to the fact that a hilly tract of unproductive moorland borders the route to the north for a considerable distance, the intersections by railway and turnpike are singularly few in number. The existing Forth and Clyde Canal has been spoken of as capable of enlargement, so as to admit vessels of the heaviest tonnage. Possibly it may be; and so also, instead of building anew, might a very small ship be lengthened and heightened, and even widened, to the measurements of a very large ship, but the result would be a very clumsy and unprofitable one. To begin with, the old work (executed over a century ago) is thirty-five miles long, or about 70 per cent. longer than is necessary now, the navigable Clyde having been carried up to that extent in an easterly direction. As a necessity of the manner in which the scheme was conceived and carried out, it changes its level no less than twenty times over its course, which is accordingly impeded by just that number of locks, not one of them of the slightest use for the purposes of a ship canal, as measured by modern ideas, the dimensions being 74 ft. by 20 ft. only, or barely sufficient to give passage to a schooner of moderate size, while excluding altogether those of larger measurements. The highest of the twenty differing levels is 156 ft. above ordnance datum. This height is attained by mounting the rise of the land on either side by means of these locks or water-ladders, and, when attained, is kept unbroken for sixteen miles,—that is, about three-fourths of the distance to which an entirely new work would run if cut through on the present narrowest section of the neck. Over this central portion of sixteen miles the old work is often very wasteful in the engineering sense: unable, owing to its conditions, to take advantage of incidental depressions of the surface, which it either crosses, by huge and costly embanking, or avoids by following the run of the higher ground, at the expense of increased length. Probably no engineer, were he on the spot surveying the valley with a view to a ship canal of the first rank, would throw away a second consideration on the very unpromising possibilities of the old canal; but the latter look rather tempting on the map to the otherwise uninformed eye, and hence a good deal of the light-weighted speculation advanced on that basis. One or two critics have advocated carrying the canal by locks up the Vale of Leven, from Dumbarton, into Loch Lomond, and on to the Forth *vid* the strath of the Endrick, thereby, as they astutely point out, saving ships a portion of the ascent of the Clyde,—which is about the same as if it had been proposed to make a canal from Tilbury round by Epping Forest into the Victoria Docks, in order to do away with the necessity of ships ascending the Thames.

Four years ago, when the project of cutting this isthmus for a ship canal on a large scale was last prominently on the *tapis*, a good many turned to the State as the only competent agency for carrying such an undertaking into execution; but it would appear that considerable advance has since been made in the popular mind as regards the financial bearing of the scheme. The formation of a ready passage for ironclads across Scotland at this important point would add enormously to the defensive forces of the nation, and there might be a manifold return speedily accruing to the investment; but, all the same, to wait for a Government strong enough and enterprising enough to embrace a scheme of the sort would simply be to wait indefinitely. It seems now to be dawning on the minds of capitalists that the scheme is sufficiently sound to stand on its own commercial merits, and it has even been hazarded that the bulk of the money necessary might be found in Glasgow, the place which would most largely benefit in a local sense. This largest of Scottish towns has grown phenomenally along with the gradual deepening of the Clyde, and it would certainly add very largely to the momentum of its growth to be put in direct touch with the waters of the German Ocean, even as it now is with the Atlantic. Its contribution to the canal traffic would, however, form only a part of the whole; on a reasonable tariff of tonnage dues a large through navigation would be induced, to which the whole of the eastern seaboard and several continental ports would contribute, in addition to the Irish, West of England, and American contingents. Very likely the present revival of interest is destined to exhaust itself without any step being taken, but, if so, it will in all probability awaken soon again, and with still more of purpose in it. The formation of a syndicate of promoters has been talked of, but it does not appear that, as yet, this has emerged from the stage of mere informal proposal.

Royal Academy Lectures. — Professor Aitchison's sixth Royal Academy Lecture (for which, owing to the space occupied by his long list of marbles, we have no room this week) will be published in the next number of the *Builder*, along with various diagrams of Roman construction, &c.

NOTES.

THE dissatisfaction with which the trading community regard the new railway classifications and schedules was strongly illustrated by a meeting held on Monday at the Cannon-street Hotel, under the auspices of the Railway and Canal Traders' Association, which was presided over by Mr. J. W. Barclay, M.P. The meeting was a large and fully representative one, and all the speakers seemed to regard the companies' proposals as unreasonable, a series of resolutions being carried protesting against various objectionable provisions. Some speakers, indeed, emphatically denounced the classifications as useless, and urged that they should be objected to altogether, as being based upon wrong principles, or, as it was also put, lacking any intelligible principle whatever. A "scientific basis" has often been demanded, but would, perhaps, when obtained, prove delusive. It would certainly be a somewhat hazardous experiment to draw up classifications and schedules upon a new and untried basis, and it would appear to be more practical at the present juncture for each particular trade organisation to examine in detail the working of the proposals so far as their business or industry is affected, lodging protests against anything considered unfair or unreasonable. Larger organisations,—such as the Railway and Canal Traders' Association,—are apparently dealing with such "general" questions as are calculated to affect all industries alike. For instance, the neglect of the railway companies to comply with the Board of Trade requirements in regard to separate scales of charges for truck and train loads is being taken up; also the question of "smalls." It seemed to be the general feeling that the limit of weight for small consignments should be reduced rather than raised, a point which was also strongly dwelt upon at a meeting at Leicester last week. It then appeared that with the limit fixed at 560 lbs., nearly all the traffic sent out by some firms would be subject to the additional impost. The proportion of small consignments is probably very much larger now than it was when the companies were content with a 112 lbs limit, and the figure now proposed might very well be reduced at least one-half. The points alluded to are altogether independent of matters of detail (which are being dealt with by sub-committees of the Association), and as the dissatisfaction seems pretty general, the Board of Trade will probably be almost inundated with objections.

WE were glad to see, from a letter from the Marylebone Vestry Clerk in the daily papers, that a meeting was to be called on Thursday evening of this week (too late for us to give any account of it) to protest against the encroachment on Marylebone-road which has been sanctioned by the Metropolitan Board of Works, in the case of the intended new building for the Samaritan Hospital. This, of course, would be the thin end of the wedge, and the prelude to an advance of the frontage-line and removal of the open space along the whole road. It is important that this should be prevented. The wide margin along Marylebone-road, which is to some extent a kind of boulevard, and might be made more fully worthy of the name, is one of the favourable points in London street scenery, and ought to be preserved, unless very strong practical reasons can be shown to the contrary. We observe that the London County Council, at its meeting on Tuesday last, agreed to ask the Metropolitan Board not to come to a decision on the matter until the Council had been consulted about it; which is a step in the right direction.

THE following answer is among the records of Parliamentary proceedings of March 5th:—

"In answer to Mr. T. W. Russell, Mr. Plunket said:—I am informed that the North British Railway Company have acquired some ground in the neighbourhood of Falkirk, on which is situated a portion of the old Roman wall, and have run a

branch line through a part of the wall, at a spot, however, where the remains are not so well defined as they are more to the east. I am told that the railway company have at present no intention of interfering further with the wall, and they can if they like place it under the protection of the Ancient Monuments Act, but I have not any power to compel that to be done."

We fear there is not much probability that the railway company will take the trouble to put the remains under the protection of the Act if no one has power to compel them to do so. That is one of the misfortunes of writing "may" in the terms of an Act instead of "shall."

THE *Πρακτικά* (transactions) of the Athenian Archæological Society for the year 1886 have just appeared, under the date 1888. The number is an unusually rich one, and contains material of such wide general interest that its seclusion in the modern Greek tongue is doubly to be regretted. The first plate is devoted to a detailed plan of the recent excavations at the precinct of the Temple of Jupiter Olympius at Athens. It supplements in many respects the plan given by Mr. Penrose in his last edition of the "Principles of Athenian Architecture." In the text that accompanies the plate the principal points of interest on which light has been cast by the excavations are noted: 1. The position and character of the propylon. 2. The tetragonal shape of the whole peribolos. 3. That the obscure semicircular building on the north side of the peribolos wall is of later date than the wall itself. 4. Some remains of drums of poros columns have been found outside the north wall of the peribolos, and from their character it seems likely they have belonged to the earlier building begun by Peisistratos.

THE same number contains also a ground-plan and restoration of the proscenium of the recently-excavated theatre at Oropos,—a theatre of which no mention is made in any ancient author, although Pausanias describes in detail the sanctuary of Amphiaaraos, to which it belonged. Special points of interest about it are the inscribed cornice and the five seats of honour disposed at wide intervals, and also inscribed. Passing over some papers of much interest, the palm must undoubtedly be given to the account of the buildings in the Acropolis at Mycenæ by M. Tzountas, accompanied by elaborate plans and a coloured reproduction of the decorative paintings in the *ἰστιά*, from a drawing by Dr. Dörpfeld. The account claims the closest attention from all architects, topographers, and, we may add, Homeric students. The more ancient structures of pre-historic dates have been overlaid and much confused by the building of a large temple of Hellenic date, but below this M. Tzountas shows there is clear evidence of a large kingly palace, and that this was supplanted once and for all by smaller houses belonging to some conquering, but less wealthy, race. The megaron, prodromos, and aithousa of the early palace are clearly made out. The megaron itself was sculptured by four columns, of which the lower portions are sunk deep into the earth. They were manifestly of wood, and from some remains of metal flaking found near at hand it seems very possible they were coated with metal. In the centre, between the four columns, is the *ἰσχάρα* or *ἰστία*, the circular hearth-place, of which the remarkable decorations have in part been preserved. The hearth is 3.40 m. in diameter, and is of curious though simple structure. It consists of a layer of clay laid on the floor of the megaron, and then plastered all over. This first layer is 0.15 m. thick. Above this have been successively laid on five thicknesses of plaster. That these were superimposed at different times is clear from the simple fact that some of them are adorned with patterns. Those reproduced in plate 5 are from the third layer, the best preserved, and they certainly deserve to be known. It is interesting to note that the Greek peasant nowadays makes his hearth, which he calls "γωνία," in just the same simple fashion. This is only one of many instances in which modern traditional use throws light on primitive custom.

WE inserted a paragraph at the last moment last week, announcing the death, on Monday the 25th ult., at the early age of 36, of Mr. Charles Richard Pink, of Winchester, an architect in steady and increasing practice, and a good servant of the profession. Mr. Pink was the pupil in architecture of Mr. Thomas Henry Watson, remaining with him till he started in practice for himself. He passed the Preliminary Architectural Examination in 1872, and the Proficiency Examination in 1875. Always taking a keen interest in education for and in the profession, he has done good service as a member of the Special Education Committee of the R.I.B.A. In 1876 he became an Associate, and in 1886 F.R.I.B.A., and was a member of the Council in 1886. After the noteworthy excursion of the Architectural Association, under Mr. Edmund Sharpe's direction, to Charente in 1875, Mr. Sharpe (who died in 1877) wished that the members of the Association should try,—at any rate, for a year or two,—to conduct the annual excursion without his leadership. Accordingly, in 1876, an excursion was made to Winchester, and Mr. Pink's local knowledge, power of management, and pleasing character were so well appreciated that the excursions were, to a great extent, managed by him till 1885, when he conducted the Banbury excursion as President of the Association. Regrets that he should have joined the majority so early will be generally felt. The memory of his relish for good architecture and for other art of all dates, of his kindly spirit, his knowledge of heraldry, and his peculiarly pleasant humour, will linger long with those who made holiday with him. As an antiquary, Mr. Pink was a most conservative restorer; no stone or detail that could possibly relate to the history of the building was ever destroyed by his order, and the churches of Soberton, restored in 1880-2, and West Worldham, 1888, and the old Manor-house at Lottisham, Somerset, all bear witness of this loving care. In conjunction with Mr. James Fowler, of Louth, Mr. Pink was architect of All Saints' Church and Vicarage, Denmead, in 1880. The Chilworth and West Baddesley Schools were built from his designs in 1875. The Catherine Wheel Temperance Hotel, Botley; Curdridge Village Club; East Worldham farm-buildings; West Bradley Vicarage (Somerset); house and stabling at Winchester; house and stabling at Wyke; and The Brewery at Wickham, are his principal works. He was a rapid and effective sketcher, and had a sound knowledge of his profession, gathered from careful study of old work and extensive reading.

ON Saturday last there took place, in the Cimetière du Nord at Paris, the funeral of the late M. Louis-Achille Lucas, Honorary Architect to the City of Paris, and Honorary Member of the Société Centrale des Architectes. M. Alfred Normand, Vice-President of the Société Centrale, attending in place of M. Garnier, who was unavoidably prevented, spoke of the works of the deceased architect, alluding especially to "Le grand groupe scolaire de la rue Tolbiac," and to the part which he had taken in the two editions of the "Manuel des Lois du Bâtiment," published under the auspices of the Société Centrale. M. Achille Lucas was the father of M. Chas. Lucas, Honorary and Corresponding Member of the Institute of British Architects, and well known to many members of the profession in London.

WE are glad to hear that the Duke of Westminster, who is one of the largest owners of important house property in London, has decided to allow none but certificated plumbers to be employed in future on new buildings on his estate. The following is a copy of the letter addressed by the Duke to the Clerk of the Plumbers' Company:—

"The Duke of Westminster, feeling the very great importance, in a sanitary point of view, of good plumbers' work in houses, and appreciating the exertions of the Plumbers' Company in that direction, has decided that none but certificated plumbers are to be employed on new buildings on his estate. Every building contract on this estate provides as follows:—

'No plumber is to be employed upon the works unless he has the certificate of his efficiency from the Worshipful Company of Plumbers.'"

We hope other large house-owners in London will follow so excellent an example.

THE Exhibition of the "Society of Painter-Etchers," at the Rooms of the Water-colour Society, contain a great deal of fine and interesting work, including, however, some that can only by a stretch of language be called "etching." Mr. A. Haig seems to have nearly deserted pure etching for "aqua-tint" effects; Mr. Finnie's landscapes (317, 329, 330) look more like photographs than etchings; Mr. Seymour Haden exhibits "The Breaking Up of the Agamemnon, Mezzotinted" (233), in which the strong dark etched lines on the shipping appear perfectly incongruous with the mezzotint treatment of sky and water; a mixture of two processes that have nothing in common. Mr. David Law's "Alnwick Castle" (12), a line etching in reality, might just as well be an engraving, all the characteristic effect of etching having been worked out of it. Some of the best of the pure etchings are to be found among the small plates hung mostly on the bottom line. Mr. R. Goff has some admirable little works of this class, notably, "Driving Piles, Venice Lagoon" (301). Among the architectural subjects on a larger scale perhaps the finest is Mr. C. O. Murray's "Lichfield" (294), a grand work of its kind. The President (Mr. Seymour Haden) exhibits a great number of etchings by no means of equal merit, and the prices affixed to those which are for sale show an appreciation of their value in which the curious visitor will not always concur; especially comparing them with the prices of better works in the room. Among the things which the Society had better have rejected are the frames full of unintelligible scratches by Mr. Sickert, which are an impudent affectation that ought not to be tolerated. Nor is it intelligible why a very small and not remarkable head by Mr. Menpes should be allowed a frame big enough for half-a-dozen drawings of that size. Among the etchings which struck us as specially good we may mention Mr. Holloway's "Victory" (28), the old ship in Portsmouth Harbour: Mr. Percy Robertson's "Godalming" (44), a little pure line etching, beautifully drawn; Mr. Wilfrid Ball's "Venice" (52); Mr. Percy Robertson's "A Surrey Bridge" (83); Mr. Haig's "Cologne" (92); Mr. Cameron's "Bowden" (105), a slightly-sketched lane scene; Mr. Haig's "Stockholm" (122), a wonderfully fine effect, but little of an etching; Mr. Slocombe's "Amiens Cathedral" (278); Mr. T. C. Farrer's "The Day's Requiem" (280), a very fine and solemn evening landscape, finished in every part, yet preserving breadth and unity of effect; Mr. Herbert Marshall's "Dordrecht Cathedral" (324), a dark, very powerful little work; Mr. Edgar Barclay's "Saving the Hay" (326), Mr. W. Strang's "After Work" (334), a rustic idyll of great pathos of expression, and Mr. Robertson's "Leaving the Old Home" (342). In Mr. V. S. Hine's "Lincoln Cathedral" (111), a fine work in a pictorial sense, the western towers are shown much too thin in proportion to the centre one, an oversight which spoils the architectural effect and truth of the etching. Generally speaking, however, architecture is well treated by the Painter-Etchers.

Bournemouth Surveyorship. — We are informed that Mr. F. W. Lacey, Assoc.-M. Inst. C.E., Town Surveyor, Brentford, has been appointed Surveyor to the Bournemouth Commissioners,—almost unanimously,—out of 172 candidates.

THE PRINCIPAL MARBLES USED BY THE ROMANS:

AN APPENDIX TO THE FIFTH ROYAL ACADEMY LECTURE.*

Being Corsi's list of Antique Marbles translated.

ABSTRACTED AND ANNOTATED BY PROFESSOR AITCHISON, A.R.A.

Latin Names.	*Italian Names.*	*Notes.*
WHITE MARBLES.		
Marmor Parium	Greco Duro	Parian from the Island of Paros. Pliny says it was called Lychnites. Used for the Mausoleum of Hadrian.
Marmor Porinum	Grechetto Duro	Found near Olympia in the Peloponnesus.
Marmor Pentelicum	Greco Fino	Pentelic marble from Mount Pentelicus, between Athens and Marathon. The outside linings of the Pantheon are said to be of Pentelic.
Marmor Hymettium	Imezio or Cipolla	Yellowish white, marked with bluish grey, giving it the appearance of ribbons.
Marmor Thasium	Greco Livido or Tasio	From the Island of Thasos. Used for covering the tomb of Caius Cestius.
Marmor Lesbium	Greco Giallognolo	Yellowish marble from the Island of Lesbos.
Marmor Tyrium	Greco Turchiniccio	Bluish. Steps of the Scala Santa are said to be of it.
Marmor Lunense	Marmo di Carrara	Carrara is close by the ancient Luna, and not far from the Gulf of Spezia. Nearly all modern statues are made of it.
Marmor Coraliticum	Palombino	Colour of a white dove, and much like ivory. Supposed to come from Phrygia.
COLOURED MARBLES.		
Marmor Numidicum	Giallo Antico	The quarries have been lately found in Tunisia. Pale yellow to tawny, and pink to red, extensively used. Some of the large internal columns of the Pantheon are of it, and those to the Arch of Titus. It has been used at the National Gallery and at the New Gallery in London.
Marmor Tænarium	Rosso Antico	From the quarries in the Promontory of Tænarum in Laconia, Peloponnesus (now called Cape Matapan). The quarries have been re-discovered, and Rosso Antico is now comparatively common. A uniformly coloured deep brick-red marble, sometimes inclining to deep purplish red, with nearly black streaks, and occasionally with white streaks or ribbons, and sometimes white, with red veins.
Marmor Tænarium	Nero Antico	From the Promontory of Tænarum to the north of the quarries of Rosso Antico. A deep black marble, occasionally showing a white line like a hair, short, straight, and interrupted.
VEINED MARBLES.		
Marmor Jassense	Porta Santa	An island off Caria. (Mr. Brindley says from the Island of Chios, where he found quarries of it.) A purplish red and white in waves, sometimes called Claudian, on account of the fondness of the Emperor Claudius for it. Called Porta Santa, from the jambs of the door-case of the Porta Santa, at St. Peter's, Rome, being made of it.
Marmor Carystium	Cipollino	From Carystus, in Eubœa. Mostly green or grey and white in waves, but sometimes red. Called Cipollino from the onion, because of its veins of mica, through which it can be divided. Columns of the Temple of Antoninus and Faustina at Rome, plinths of Pœcile, Hadrian's Villa.
Marmor Chium	Affricano	From the Island of Chios. (Mr. Brindley says he found no quarries of Affricano there.) A magnificent marble, said to be a shell marble, but mostly known to us in its brecciated form. Dove-coloured, pale pink, or green, with masses of black and crimson. The skirting of the so-called libraries at Caracalla's baths are of this. Door-cases at Dorchester House.
Marmor Molossium	Fior di Persico	From Epirus, now Albania. White, with veins and clouds of purple and crimson. Mr. Brindley says he found a quarry in Elba.
Marmor Synnadicum	Pavonazzetto, or Frigio, Dociminio, or Migdonio	From Phrygia, near the town of Synnada. White and sometimes yellow, like old ham fat, with purple veins. Much admired by Hadrian, who used it for his Mausoleum. About half of the large columns inside the Pantheon are of this marble. Horace calls it Phrygius lapis, and Juvenal Phrygia columna.
Marmor Phengite	Bianco e Giallo	From Cappadocia. White, with yellow veins. According to Corsi, very rare. Domitian had the portico of his palace in which he walked lined with this, that he might see people reflected in it before they were near enough to stab him; but it did not save the tyrant's life.
Marmor Corinthium	Giallo Tigrato	From Corinth. The only specimen I ever saw in England is a vase of Mr. Holford's, at Dorchester House, said to be of this marble. This is a grey, veined with yellow, in only fine veinings; but this does not at all correspond with Corsi's description. He says it has a straw-coloured ground, and that the veins are always circular in form, inclosing a deeper yellow, resembling a panther's skin. I fancy there are statues of wild beasts in the Vatican made from it.
Marmor Batthium	Bigio Antico	Site of quarry unknown, but supposed to come from Cyrene, in North Africa. Grey, with spots, waves, and bands.
Marmor Luculleum	Bigio Morato	From the Island of Melas in the Nile. First brought to Rome by L. Lucullus, the great general, and called after him. A bluish black that looks dusty. The only marble named by the ancients from the first user of it.
	Occhio di Pernice	Site of quarry unknown. Tawny, with violet spots, having some semblance to the eye of the partridge.
Marmor Proconnesium or Cyzicum	Bianco e Nero Antico	From the Island of Proconnesus, in the Propontis, or Sea of Marmora. I believe this to be angular masses of black in snow-white cement, commonly called Grand Antique. There is also a white marble.
Marmor Celticum	Bianco e Nero di Francia	France. Site of quarries unknown in Corsi's days. Black ground interspersed with reticulated veins and spots of milky white.
	Bianco e Nero d' Egitto	Site of quarries unknown. Shell marble, the shells white. Called Egyptian, because Egyptian idols are found carved in it.
	Bianco e Nero Tigrato	Site of quarries unknown. The white and black variegations are generally of equal volume.
Marmor Rhodium	Giallo e Nero	The island of Rhodes. Black, with gold veins. Said by Mr. Brindley to be from Porto Venere, in the Gulf of Genoa.
	Marmo di Cotanello	Quarries in the Sabine Country, north of Rome. Of several colours, but not vivid. Pale rose verging on deep peach blossom, with thick and short veins of white. Found at the Villa of Lucullus, near Terracina.
SHELL MARBLES.		
Marmor Megarense	Lumachella Bianca Antica	Megaris, between the Corinthian and Saronic gulfs. A white shell marble used for columns and statues.
Marmor Schiston	Broccatello Antico	Tortosa, Catalonia, North of Spain. The well-known brocatello of golden yellow and pale purple, with occasional irregular white spots. A shell marble.
	Lumachella di Egitto	Site of quarry unknown. White with bluish grey or black oyster-shells. Rare, the ground is sometimes of bright yellow or a coral red.
	Lumachella d' Astracane	Site of quarry unknown, but this marble is said to come from Agra, in India. Usually a yellow or pale greenish yellow, marked with red. There are white and flesh-coloured varieties.

* Published in last week's *Builder*, p. 168, *ante*.

SHELL MARBLES (*continued*).

Latin Names.	*Italian Names.*	*Notes.*
	Lumachella d' Astracane dorato	A yellow of golden colour, with shells; the rarest has a purple ground, with yellow shells.
	Occhio di Pavone	Site unknown. Red, purple, greyish white, and black ground; the shells cut through are white, and make the eyes; sometimes the shells are red.
	Corno di Ammone	Site unknown. Those marbles that contain ammonities in a perfect form.
	Lumachellone Antico	Site unknown. Bluish grey; ground containing white ammonites.
	Stellaria	White, bluish grey, and red ground, with shells of star form.
	Lumachella Nera	A mulberry-coloured black, with fragments of shells. Rare. There is also the rose coloured, the grey, the yellow, and the purple.
	Lumachella Rossa	Site unknown. Deep red ground, with small white circles.
	Lumachella Rosea	Site unknown. Like the above, only pale pink ground.
	Lumachella Bigia	Site unknown. Grey ground.
	Lumachella Gialla	Site unknown. All straw colour. A mass of decomposed shells, sometimes with purple marks.
	Lumachella Pavonazza	Site unknown. White or red shells in a purple ground.
		ALABASTERS.
Marmor Alabastrum	Alabastro Antico	One quarry is said by Pliny to have been named from a town called Alabastron, near Thebes, in Egypt (Lib. v., c. 11), on the Nile, but also came from Damascus, Carmania, Cappadocia, and India. He says, "That which is of a honey colour is most esteemed, covered with spots circling in whirls," which perfectly describes the Oriental alabaster of the altar columns of St. Paul, outside the walls at Rome. It was confounded with onyx. The onyx mentioned in Genesis (cap. ii., v. 12) is said by Calmet to have been alabaster; but when the constituents were unknown, it was easy to mistake the two when similar in colour. Oriental alabaster is a hard carbonate of lime, while most of the European alabasters are sulphate of lime, and much softer, and every one differing in colour was called by a special name, as, for instance:—
	Alabastro Cotognino	Quince.
	„ Pomato	Appled.
	„ a Giaccione	Iced, or with lumps of ice.
	„ a Onice	Onyx.
	„ a Nuvole	Clouded.
	„ a Occhi	Eyed.
	„ a Tartaruga	Tortoiseshell.
	„ Sardonico	Sardonyx.
	„ a Pecorella	Sheep.
	„ Fiorito	Flowered.
	„ Fortezzino	Fortressed.
	„ di Palombara	Of Palombara.
	„ a Rosa	Rose.
	„ dorato	Gilded.
	„ Erborizzato	Herb.
		It is by no means certain that specimens of onyx, chalcedony, or jasper were not mistaken for it.
		BRECCIAS.
Marmor Lydium	Rosso Brecciato	Site unknown. Red ground with fragments of vivid white.
	Breccia di Aleppo	Site unknown, though it is supposed to come from Aix, in France, or from Belgium. Gray, red, brown, and black fragments, in which yellow prevails.
	Breccia Dorata	Site unknown. Yellow fragments in a purple ground.
	Breccia Corallina	Site unknown. Small white fragments of coral in a paste of bright red.
	Breccia Gialla e Nera	Site unknown. Small black fragments in a yellow paste.
	Breccia Color di Rosa	Site unknown. Flesh-coloured paste, with darker red fragments.
	Breccia Gialla Ombrata	Site unknown. Orange paste, with fragments of still deeper colour, always triangular in form; but the colour of the fragments varies, and it is so called because the bands of yellow where they touch the fragments are darker.
	Breccia della Villa Adriana	Site unknown. Ground brown, colour of roasted coffee; also yellow, red, green, blue, purple, and sometimes black and white.
	Breccia Traccagnina	Site unknown. Of various coloured grounds, containing fragments of different colours. Called so from its supposed resemblance to the mask of a harlequin.
	Breccia Pavonazza	Site unknown. Purple ground, with various coloured fragments.
	Breccia a Seme Santo	Site unknown. So called from its resemblance to medicine given to children in various coloured sugar-plums.
	Breccia de Sette Basi	Site unknown. Called so from having been found at the Villa of Septimius Bassus on the Appian Way. Ground always purple, with oblong fragments of white, yellow, and red. The pattern larger than "Seme Santo."
	Breccia Bianca e Nera	Site unknown. Ground, dark mulberry, with pure white fragments, reticulated white veins.
	Breccia Rossa	Site unknown. Clear red ground, inclining to purple, with ellipitical fragments, pink, greenish grey, white, and yellow.
	Breccia Verde	Site unknown. Ground colour of an olive-leaf, small triangular fragments of a darker green.
	Broccatellone	Site unknown. Peach-blossom ground, with canary-coloured fragments.
		OTHER MARBLES.
Marmora Lunensia	Bardigli	From Carrara. Grey ground, with darker markings.
Marmora Pisana	Marmi Argillosi	From the neighbourhood of Pisa. Mostly bright green. The dendrites of this have trees on a yellow ground.
Marmora Ligustica	Serpentine e Graniti	Ligurian stones, from the principality of Genoa. The green of Polcevera, and a green and white granite.
		FALSE JASPERS.
Marmora Tauromenitana	Diaspri Teneri di Sicilia	From Taormina, in Sicily. Called jaspers from their resemblance in colour and figure to real jaspers.
		SERPENTINES.
Lapis Ophites	Verde Ranocchia	Serpentine. Said to come from Egypt.
Lapis Augusteus	Verde Ranocchia Ondato	Supposed to have been first discovered in Egypt in Augustus's reign. Dark green, with lighter green marks, mixed with a yellowish colour, always orbicular.
Lapis Tiberianus	Verde Ranocchia Florito	Quarries in Egypt. A green ground covered with fine white veins. Used also by the Romans as an amulet against headache and serpent bites (Pliny, N. H. Lib. xxxvi., cap. 11).
Lapis Atracius	Verde Antico	Quarries are said to have been near Atrax, ten miles from Larissa, on the River Peneus, in Thessaly.
		The celebrated Verde Antique. A green paste, in which there are fragments of black and white. The most beautiful large specimens of the emerald green sort are table tops at Dorchester House. The rarest is said to have blue in it.

SERPENTINES (*continued*).

Latin Names.	*Italian Names.*	*Notes.*
Lapis Amiantus	Amianto	Asbestos, from which shrouds were woven, so that when the body was consumed the bones might not be lost. It is said to have been originally found in Cyprus, but is now found in many parts of the world,—Savoy, Corsica, Cornwall, Scotland, and the United States. Vulgarly called by the Italians "Wood of the Cross" and "Feathers of the Holy Ghost."
Lapis Æquipondus	Pietra Nefritica	A hard compact stone of dark green colour, used by the Romans for weights, in which case one or two rings were leaded in. Two may be seen at the Temple of Diana at Nimes.
		SLATES.
Lapis Ligusticus Lapis Thebaicus	Lavagnone Lavagna Tigrata	Slate. Although these were occasionally used for works of art, I omit them.
		SPAR.
Murrha	Spato fluore	Fluor spar (commonly called "Blue John"). According to Corsi, and this agrees with the ordinary description, the covering and stopping with shellac and gums gives the perfume; and the softness answers to the description. Pliny says it was first introduced to Rome by Pompey in his three triumphs over the Pirates and the Kings Mithridates and Tigranes; and that it came from the empire of the Parthians and Carmania, *i.e.*, from Tartary and Persia. Modern geologists say it is a variegated agate or jasper.
		BASALTS.
Lapis Basanites	Basalte Propriamente detto	Basalt from Æthiopia. Said to be so called from Basal, the Ethiopian for "iron;" black, coffee coloured, and green. Has been used for columns and statues.
Lapis Lydius	Pietra di Paragone	"Touch stone" for trying the precious metals. A sort of basalt, said to be from Lydia.
		PUDDING-STONES.
	Pudinghi	"*Pudding stones*," breccias of pebbles in a hard paste, mostly silicious. "The green breccia of Egypt" is one containing pebbles of porphyry, granite, basalt, and quartz, in a green paste. Some have the paste of purple, and of grey. Sometimes called by the Italians Breccia frutticolosa or fruity breccia. Messrs. Farmer and Brindley have a fine specimen of the green breccia of Egypt. The quarries were found by Mr. Brindley between Kossier and Koft, near Hamamat, in Egypt.
		PORPHYRY.
Lapis Porphyrites	Porfido Rosso	Porphyry, called so from its purple colour. Main quarries in Egypt, near the Red Sea, called Thebaic stone. Called leptospsephos, or small stoned, by Pliny, from the white specks, or spots, in it, and by Byzantine writers "the Roman stone." Fragments of red porphyry columns are found at Caracalla's Thermæ, and in front of the Basilica of Maxentius, Quarry now worked by Messrs. Farmer and Brindley, near Geb Duchan.
" "	Porfido Nero	"Black Porphyry," with white spots.
" "	Porfido Bigio	"Grey Porphyry," spotted with circular white and square black marks.
" "	Porfido Verde	"Green Porphyry," a sort of invisible green, with white spots.
Lapis Lacedæmonius	Porfido Verde detto Serpentino	Green. Vulgarly called by the Italians Serpentine. From Laconia, in the Peloponnesus. Always of small dimensions; mainly to be found in pavements of Opus Alexandrinum and in inlays. Signor Boni sent me a piece from Aquileia that had been subjected to fire when the town was burnt by Attila, which had become red. The colour is a deep yellowish green, with fragments like almonds of a lighter colour.
Lapis Memphites	Serpentino Bigio	Grey porphyry. Said to come from Memphis, in Egypt. Grey, with black spots.
		GRANITE.
Lapis Pyrhopœcilus	Granito Rosso	Red granite from Syene, now Assouan, on the Nile. Of this are the red columns of the portico of the Pantheon, of the Thermæ of Caracalla and Diocletian, and Pompey's Pillar at Alexandria.
Lapis Psaronius	Granito del Foro	Called Psaronius from being spotted like a starling. Grey granite from the Claudian Mount in Egypt, near the Red Sea. No. 7. Monoliths of the portico of the Pantheon, columns in the Forum of Trajan, and those in the Tepidarium of Caracalla's Thermæ, and the one in the square of Sta. Trinità at Florence. The Italian name is said to be from the columns in the Forum of Trajan.
Lapis Syenites	Granito Bigio	Grey granite, said to come from the famous quarries at Syene, on the Nile.
Lapis Hethiopicus	Granito Nero	Black granite from Æthiopia.
	Granito Bianco e Nero	Syenite, black and white.
	Granito Verde	Site unknown. Green granite. Some has been lately found in Sweden, I believe.
Lapis Judaicus	Granito Grafico	Quarries between the Red Sea and the Nile, between Keneh and Kossier, close by the quarry of the Breccia Verde. White with black markings that look at a distance like Hebrew writing.
Lapis Ligusticus	Granito de Genova	From near Genoa. A greenish granite.
	Granito dell' Isola del Giglio	From an island off the lower part of Tuscany. A purplish granite.
	Granito dell' Elba	Grey granite from Elba. Used by the Romans; but not mentioned by any writer.

THE ARCHITECTURAL ASSOCIATION.

THE tenth meeting of this Association for the present session was held on the 1st inst., in the meeting room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair.

The following new members were elected, viz., Messrs. W. Fitzmaurice, E. C. Cockburn, and F. L. Rossignol.

Mr. W. Burrell was elected to fill a vacancy on the committee.

It was announced that the first "Common Room" meeting would be held on March 12, in the room downstairs. These meetings would be open, and their object was to cultivate good-fellowship. The subject for discussion would be "Travelling Students,—their artful ways and works."

The Chairman said he was sorry to inform the members that on the 25th ult., at Hyde, near Winchester, passed away their esteemed Vice-President, Mr. Charles Richard Pink. Having been recently President of the Association, Mr. Pink was more or less well-known to them all, while to those who had the privilege of closer fellowship with him, the loss was unspeakably sad. Mr. Pink succeeded the late Mr. Sharpe as organiser of the autumn excursions, and from the year 1876, when Mr. Pink undertook that work, and organised the excursion at Winchester, down to 1885, the success of those meetings depended largely upon his exertions and popularity. Mr. Pink was peculiarly adapted for giving enthusiastic support to movements of the sort. He had a most happy knack of making friends. He was also one of the most rapid and prettiest sketchers he (the speaker) had ever come across. Being unfortunately cut off at so early a period of his career, Mr. Pink had not had many great opportunities of displaying the wonderful knowledge he had of his profession; but those who had seen his work knew what exquisite refinement there was in its detail, and would recognise how much the profession had lost by his untimely decease. He had attended Mr. Pink's funeral that morning as representing the Association, and had conveyed to the family the deep and earnest sympathy of the members in their bereavement.

A vote of condolence was passed, and ordered to be forwarded to Mr. Pink's relatives.

Mr. J. T. Micklethwaite, F.S.A., then delivered a *viva voce* address on "The Life of an Old Parish Church." He said that the subject was one about which he had often talked to archæologists and others, but never before an assemblage of architects, though it was a matter which had its strong architectural side. What he chiefly wished was to make them appreciate the value of old

churches, not merely as piles of stone, but as living things. He had chosen a typical parish church for this reason. They were apt to lump all old churches together, and speak of them as if they were the same; but there was one thing about parish churches which made them specially precious,—that whereas the great abbey churches were nearly all the work of rich corporations, or of men of high social position, the parish churches were specially the product of the people. Furthermore, they were as a rule far older than the monastic churches, the fact being that it was impossible to say how old they really were. They knew something about the foundation of most of the monastic and collegiate churches. The largest number of those were founded after the Norman Conquest, but at that time the old parish churches were in existence, and although now they showed externally work principally of the fifteenth century, internal evidence of very much older work was generally to be found, and it was his desire that evening to show them how to look for it (applause). The history of the English church began with the advent of the English into Britain, but prior to that there existed the old British church, which seemed to have been pretty widely distributed. The Romanised Britons were practically a Christian body, while the Britons who had maintained their independence were altogether Pagan. The Christians in those early days must, therefore, have had some sort of places to worship in. He was afraid it could not be proved that any such existed still, but there was little doubt that many of the present parish churches stood on sites which were so occupied even before the coming of the English into this country. The early Christianity of the southern part of Britain was undoubtedly wiped out at Anderida, but in Wales and Cornwall, which were never Anglicised as were the other parts of the country, Christianity must have continued, and, of course, where Christianity existed there could not fail to be churches for the worshippers. When the early missionaries came from Rome, they found the remains of those old churches, but they were not the same as those which the missionaries built. Some remains of the latter were still to be seen, such as the churches at Hexham and Ripon, built by St. Wilfred. In such instances they saw church of the definite basilican type. The lecturer here showed a plan of Brixworth church, built after the Italian tradition, adding that at Peterborough there had lately been found the remains of a church of the seventh century, identical, he believed, in plan with that of Brixworth. There was nothing like that plan to be seen in the parish churches now. While the monks were busy building their monastic churches another set of men were at work, all over the country, namely, the Celtic missionaries from Ireland and Scotland. The plans of the Celtic churches were entirely different from those of the basilican type, in proof of which he exhibited the plan of the monks' houses and churches at St. Michael's Rock, which were merely in the form of a square cell internally, and beehive shaped externally. In Ireland the next step was to be found, viz., a square building with a small chancel joined on, and with a very narrow arch of about 3 ft. across. More than one half of our parish churches could be traced back to that type, as instanced by the plan of Boarhunt, a Saxon church. Although, therefore, the monks and the court followed the fashion introduced from abroad, the people, when erecting churches for their own use, followed the type of the Celtic builders. In course of time the types would mix, the churches became thoroughly national, and, there being no further importations of foreign missionaries, all the new churches were built by the people. The arch still continued to bother them a good deal; they could make a good span in wood, but they hesitated about throwing any great width of stonework without something to support it; the aisles also seemed to have dropped out. Wherever a church resembling a basilica was found, it showed that it was an early church, built under the missionary influence. They would also notice that good architectural work generally meant early work in Saxon times. The lecturer then exhibited a plan of the church in Dover Castle, showing the next step towards a cross church. That appeared to be the shape which was common for the largest churches about the time of the great architectural revival, which took place at the time of the Norman Conquest. Nearly all the town churches were to be traced back to that type, and the smaller country churches to the Celtic or Irish type.

Mr. Micklethwaite then pointed to the plan of the church of Wakefield, which he took as a typical example, showing the changes that many churches had undergone. The plan of the church at first was almost identical with that of the church in Dover Castle. It was built about the year 1,100, and it had not long been erected before the good people of the town thought it was not large enough. They therefore added an aisle on the north side, because in those days they were wont to bury on the south side of the church. Then, in the thirteenth century, the church was enlarged by another aisle being built over the grave-yard. In adding these aisles they rather cut into the supports of the tower. Norman work was generally badly built, the masons in those days working on the remains of a tradition which had come down to them from the Roman times. Nearly all the Norman towers had since tumbled down, and there were historical notices of the towers falling at Ely and elsewhere, and those of Chichester and Peterborough had gone in our time. It was evident that the same sort of catastrophe happened at Wakefield, and the place having become a complete wreck, it had to be rebuilt, and the walls were raised and the church made more dignified and lofty. Then came the great visitation of "The Black Death," a plague said to have cleared off two-thirds of the population of Europe, and which stopped building. Fifty years after the plague, however, it occurred to the people of Wakefield that it was time their church had a tower, like those of other towns of equal importance. At that time tower-building was a slow process, taking sometimes as much as one hundred years or more to complete. Had they placed their tower, therefore, in the old position,—in the middle of the structure, it would have interfered seriously with the daily use of the building. They therefore built it at the west end, and when it was carried up clear of the roof, they joined it on to the church, so that a plan of a church with a tower in the middle became that of a church with a tower at the west end. By this time they had taken away their west window, and, the church being darker, they built a clearstory. Afterwards, having perhaps more money to spend, they began by pulling down the chancel, and re-building another chancel, with lengthy aisles, the full width of the projection of the transepts. The cruciform shape had now disappeared, the only thing remaining of the old church being the ancient Norman stair of the turret in the transept. The church by this time had the appearance of a basilican church, though it was in no way derived from that form. The point he wished to impress upon them was that here they had got a church which had been growing for over 400 years, though people would tell them that its date was of the fifteenth century. In fact, that church was not an exception, for nearly every parish church, with a similar plan, had gone through a process as complex as that at Wakefield. He would like to say a word as to what should be done with such a church. But the story did not stop at the end of the fifteenth century. The fabric generally remained of the shape it took at the commencement of the sixteenth century, but many a church had been played tricks with, by sticking up galleries and taking them away, and by putting burial vaults under the foundations of the principal pillars. Then would come some learned architect, who would say, "This is a fourteenth-century church, but unfortunately some Perpendicular rascal has put a window there. Take it out, and put in one of the period" (laughter). Then the architect went on, until he left nothing of the original history of the church, which became a nineteenth-century one of his own making. Many good architects had done that, and when any of his hearers had churches to deal with, he hoped they would begin by trying to find out what was the old story of the church (applause). The story was as interesting as the beauty of the building; and the duty of any architect who had to manipulate it,—he would not use the horrid word "restore,"—was to find out its history. Furthermore, there was the matter of the arrangement. People had gone on altering churches to suit their needs, and they had a perfect right to do so. All he contended was that in making those changes, which they might honestly do to suit their wants, the records of the older wants should not be obliterated, because those had of themselves a very valuable and interesting history. Indeed, when once the true story of a building was grasped, he did not believe any one of them would willingly take anything from it, though they might add to it. Then came the difficulty as to how they were to add. If a church had lost its tower, or had a miserable one, and it was desired to erect a new one, as in the case of Long Melford, the old school of architects would deliberately set to work to imitate the older church, and try to make believe that their nineteenth-century tower had been built by John Clopton and his friends in the fifteenth century. That was exactly what ought not to be done. They had not the same facilities now for dating their buildings as the old builders had, because now-a-days we had no traditional style. The new work ought to show that it was distinctly modern, and if such work was added to honestly meet the requirements of the times, they were adding legitimately to the history and the value of the buildings, without taking away from it (applause). If they took the old building, scraped it over, and made it spic-and-span, it would not add much to the use of the church, nor would it do so to knock out the large fifteenth century windows, put up originally because more light was required, and set in their place little narrow lancets to keep the light out, sticking in some beastly stuff called Cathedral glass, which made the place look like the Brighton Aquarium inside (laughter). Alterations of that sort were always mischievous, while alterations that honestly represented wants were good. Those good people, who were always crying out against touching an old church,—and he was glad to say they were generally getting converted,—entirely forgot that they were stopping the process by which the old church obtained its history and interest. He would like to say a word or two about old furniture, because now and then one came upon old bits, and did not know what to do with them. The best course was to leave them alone. Should they fall in with a window with a few little bits of glass, they should not allow the parson to have them cleared out, and put into a small window in the vestry. They should be left where they are. They would not be of any great interest to a man who had seen thousands of better pieces in other places, but they would be interesting to the people who went to their own church. It was the same with many other things; if they were not in the way, let them remain just as they were. It was quite another thing if they were wanted for use. An old and ricketty lectern might be mended. On one occasion he went to Derbyshire to see a curious old font, but in its place found a new one very carefully copied from the old font. The parson knew nothing of what had become of the old one, but no doubt some architect had been there,—he only wished he knew his name, for he would tell it (laughter),—and had "restored" it. Then doubtless the contractor, finding there was a decentish piece of stuff at the bottom, used it for walling, and so it disappeared, like many other things. Some things were so far broken that they could not be used without being mended, while there were many things that were not wanted now. For instance, he had seen a fine Easter sepulchre, on which somebody had spent a lot of pains in putting new cusps and other things, which made it not a bit the better, nor did it add to the use of the church. It was a monument of the past, its use was gone, and, therefore, why could it not be left alone to tell its story? The same thing applied to tombs. They were not things of use, therefore let them be left as they were. He held that within proper rules it was right to remove such things, should they interfere with the proper use of the church, but it should be done carefully. An old monument was a thing that should be taken as a whole, and not cut down, as at Westminster Abbey, where some comical effects were to be seen, because the part of Hamlet had been "restored" out of the piece. The real difficulty about mending an old church was in the case of the fabric being almost worn out, and he had seen instances where architects of good name had said, "You cannot do anything with it; you must pull it down." At first sight he had been rather inclined to agree with them, but, as a rule, he found it worth while to mend the fabric. Some little time ago he had

the experience of an example of Early English work, built without foundations, which had gone over, but all the walls of any value were pretty good. Two men of good repute had condemned it, aided by one of the very best builders; but he had the pleasure of seeing the builder set to work to make it right, and now it was stronger than ever. Such things were usually only a question of trouble. He therefore wished his hearers, when old churches were out of health, instead of doing away with them and erecting new ones in their stead, to set to work and put them into good health once more (applause).

Mr. Alexander Payne proposed a vote of thanks to Mr. Micklethwaite, and congratulated him on the way he had developed his subject. He had come in somewhat late, and he wondered whether the lecturer had mentioned some of the old British churches in Cornwall, such as St. Perrin's, which had been buried in the sand since the fourth century, or St. Constantine's, on the Cornish coast, which were nearly like the early examples mentioned by the lecturer, except that the division between nave and chancel was less marked. The development of the church had pursued two courses, In the East it seemed to have taken the form of the Greek cross, as in Sta. Sophia, from which the Mahommedans had got their mosques and the Russians their modern type of church. In Western Europe, again, it seemed to have taken the form of a parallelogram, derived most likely from the basilicas. At the fine old parish church of Shifnal, Salop, with which the speaker was well acquainted, almost exactly the same development had taken place as at Wakefield, except that the tower had not been moved from the centre. Mr. Micklethwaite's remarks on the vexed question of restoration were admirable. No more harm could be done to a church than by the man who had a mania for some particular style. He did not know any country in the world which possessed such parish churches as England did, with so many characteristic and varied features. Indeed, the wealth of genius shown by our ancestors in designing splendid buildings was one of the things architects had more reason to be proud of than anything else in their country.

Mr. F. T. W. Goldsmith, in seconding the vote of thanks, said it would have been interesting if they had been told how the church grew as the wants and faith of the people changed and the ritual became more elaborate, followed by a demand for an increased number of chapels. It seemed to him that the real type of the parish church was the basilican form. In the ninth and tenth centuries the Norman and English plans were almost identical, and then the change took place, for with the Norman invasion the English plan entirely altered, and the new plan of Canterbury Cathedral was almost the same as that of St. Stephen, at Caen. In later ages there was a tendency to revert to the early basilican arrangement. He did not quite agree with Mr. Micklethwaite as to restoration. Though much had been done in the past to damage old churches, at the present time architects were very careful as to how they treated them.

Mr. Henry Lovegrove said he supposed Mr. Micklethwaite would not ask them to spare anything inserted in a church between the Reformation and the present time, unless it showed distinct artistic style?

Mr. N. C. Nisbett remarked that he had carefully measured the church at Eastbourne, which appeared to have followed the lines laid down by Mr. Micklethwaite.

Mr. Sydney B. Beale said that the west tower formed a very useful part of the church, and no doubt that weighed heavily with the Mediæval builders in altering its position, and placing it where its ground story could be of use. The architects of the present day were not all antiquaries: they had very serious work to do, viz., to earn their living, while it required almost a lifetime to appreciate and go into the story of every building.

Mr. C. H. Brodie hoped Mr. Micklethwaite would not go away with the idea that the members were such Philistines as Mr. Beale appeared to be (applause).

The Chairman asked Mr. Micklethwaite the best way to look for the old work.

The vote of thanks was then put, and carried by acclamation.

Mr. Micklethwaite said, in reply to the last question, that a man had to learn it for himself, there being no book that could teach him. His general advice was not to bother about the outside of the church, but go inside, and trace its plan, looking narrowly at the bases of the pillars, and finding out how the plan became complicated. With regard to its being an antiquarian question, one good gentleman had said they had to earn their living, and had not the time to fritter away in careful archæological study. But what would people think of surgeons who said,—"We have our living to get, and so we cannot waste our time studying anatomy" (laughter). It was the architect's duty to qualify himself for dealing with old buildings by knowing all about them. He did not agree with Mr. Lovegrove that it was their duty to take away from a church everything which had been put up since the Reformation. English history did not stop at that particular epoch, and many of the things people sought to remove were those which they should be careful not to destroy. Why, for instance, should the harmless lion and unicorn, or the table of benefactors, be turned out? Classic churches were deeply interesting, as were the Classic alterations to old churches, and where a church, even of the Georgian times showed good work, it should be preserved (applause). He might have said a great deal about the ritual of the Church. Every alteration was made for the use of the times, which were continually changing. Everything in the service helped to develop the church, and it should be remembered that the churches in the Mediæval ages were more used than they now were, being then utilised as the Mechanics' Institutes, the Clubs, and the Architectural Associations of the period (laughter and applause).

FREE LECTURES TO ARTISANS AT CARPENTERS' HALL:

ENGLISH FURNITURE OF THE EIGHTEENTH CENTURY.

PROFESSOR G. BALDWIN BROWN, M.A., Edinburgh, delivered the third * of the present series of free lectures, under the auspices of the Carpenters' Company, on Friday evening, February 22, his subject being "English Furniture of the Eighteenth Century, as illustrating the Classical Revival." In the absence of Sir J. C. Lawrence, Bart., Mr. Edwin Lawrence presided, and there was a large audience.

The lecturer said he would speak of his subject from the general point of view as illustrating the taste in design and ornament that prevailed at different periods during the eighteenth century, and not from the technical standpoint. He approached the subject from the more general and artistic side, dealing with the broad aspect of the productions of the craft of our famous cabinet-makers, rather than with peculiarities of make and material. The famous English makers and designers of furniture of the eighteenth century were, first and foremost, Thomas Chippendale, who flourished in the early and middle portion of the century, and later, Heppelwhite and Sheraton. With these they must associate the names of the distinguished brothers, Robert and James Adam, who were among the leading architects of the latter part of last century, and who were accustomed to design not only the exteriors of private dwellings, but also every detail of the interior decoration, including the furniture, and even the silver and glass to be used. He thought it would be best to begin by forming a general idea of the work of these designers and makers, and for this purpose he exhibited a series of examples by means of the limelight. In passing, he noticed the differences in style of design and ornament in different periods. Proceeding, he said that when one compared the work of these men with that which was turned out to-day in the ordinary course of business from our workshops and factories, one noticed that Chippendale and his companions and successors were artists,—that was to say, each piece they turned out had been the subject of individual study. The general style and motive of each had been thought out, and then this particular motive had been carried through the whole design. The ornaments were not a mere haphazard collection; they were all intimately related, so that the whole piece was harmonious throughout. Very often the motive was not happily chosen, but it was always selected deliberately and for some reason. It was not mere fashion or routine that determined the forms, but the artistic taste and fancy of the maker. Then, secondly, this taste and fancy had been controlled by sound judgment, which prescribed that considerations of use and of comfort should have equal weight with those of appearance. The chairs were roomy, solid, and inviting, the tables stood firm, and bureaus and writing-tables, &c., were conveniently arranged. The designs of chair-backs were very varied, but they were so contrived as to preserve a certain indispensable minimum of solid material. They did not sacrifice construction to elegance or ornament. Then the lines in themselves were well considered and carefully drawn and composed. The curves were not struck by the compass, but were subtle and varied. Chippendale's chair-backs were pleasing as designs merely from their composition of lines. The material and workmanship was also excellent. Two phases of ornamental art were well marked in the examples they had seen. There was a delight in soft and flowing curves, and a tendency towards exuberance in ornament. Then there was a satisfaction in straight lines, and simple, though graceful, adornment. The first was best illustrated in Chippendale's florid designs for beds, cabinets, and mirrors; and the second in the work of Sheraton and Adam. This difference of style was not only marked in English furniture and decoration. It represented an artistic movement affecting European taste in general, the headquarters of which were in France. During the eighteenth century French taste in ornamental art had a very large influence over the taste of Europe in general, and it was to France they must look to understand the significance of this artistic movement. The history of decorative art in France proceeded by certain well-marked stages,—from the time when the art of the Italian Renaissance was introduced into it in the first half of the sixteenth century, to the period of the first Empire of Napoleon Bonaparte, in the early part of the nineteenth century; so they had about three hundred years during which decorative art in France greatly flourished and almost dominated the art of Europe. The character of the art of the Italian Renaissance, transported to France early in the sixteenth century, was very much what Classical decorative art had been in the days of the Greeks and Romans. The human figure was largely used, and with that they had the conventional leaf and flower ornament. In the best Classic and Italian work these forms of decoration were used sparingly, and with a proper attention to the choosing and the placing of them in relation to the character and the structure of the object to be adorned. Then there was also a freer, lighter style of decoration that appeared both in Classical times and in the times of the Italian Renaissance, in which grotesque figures, human and animal, birds and beasts of all kinds, objects such as vases, candelabra, columns, garlands, tufts, bouquets, &c., were spread lavishly over the surface, to be decorated with the liveliest fancy, and often with the most elegant taste, but without the method and severe economy of the more dignified work just noticed. This lighter style of decoration was seen especially in the adornment of Roman and Pompeian houses. It was copied in Italy in the sixteenth century, especially by Raffaelle in the Loggie of the Vatican. Both these forms of decoration were brought to France, where they found figure-work with conventional foliage, and also the lighter grotesque or arabesque decoration, done in the first place by Italian and then by native French artists. The reign of Louis XIV. (1643–1715) marked the period when the decorative arts in France reached their greatest height of splendour. He was the most powerful, the most despotic, of European sovereigns, and the greatest lover of pomp and show. His expenditure on works of art in the precious metals was something fabulous. Not only were magnificent lustres, sconces, lamp-stands, and the like, constructed of silver in the State factory of the Gobelins, but what was generally made of wood in objects such as tables, chairs, and couches, was executed for the "Grand Monarque" in this precious metal. In his throne-room at Versailles were to be found a silver throne 8 ft. in height, a silver chimney-piece, and tables and *guéridons* (lamp-stands) of the same material. A balustrade of silver, 2 ft. 6 in. high, fenced off the bed in the royal sleeping-chamber. With all this profusion and luxury, the artistic forms employed in the Louis XIV. period remained essentially the same in character as those of the Italian and French Renaissance. They were Classic in

* For reports of the previous lectures, see *Builder*, pp. 109, 127, 149, *ante*.

type, and were employed with a certain feeling for grandeur and dignity, which preserved considerable severity and decorum throughout the style. To this magnificent period, when wealth and luxury had not yet undermined the dignity of the decorative arts, succeeded the period known as that of Louis Quinze. This was a time of dissipation and frivolity, when restraints of all kinds were relaxed, and when art yielded to the prevailing spirit of giddiness and licence. Decoration by figure-subjects was still in vogue, and the paintings of Boucher and his school, though excellent in decorative effect, were in motive light, and even licentious. But what chiefly characterised this period was a certain style of ornamentation known as Rococo, made up almost entirely of curves and flourishes, often very florid and fantastic, but at the same time beautifully composed and pleasing to the eye. The contrast of this ornamentation with that of the preceding period was most marked. In the Classical style and its derivatives down to the time of Louis XIV. the ornamental forms employed always had some meaning. They might be human or animal, conventionalised leaf or floral forms, or bands and twists derived from textiles, but they were all copies, more or less distant, of natural objects, and were used with some intelligent sense of what they were and what they signified. In this Louis XV. period, any constraint of this kind was quite thrown off, and the Rococo ornamentalist spread his lines and curves in perfect freedom and abandonment over the surfaces to be adorned. The only natural objects recalled by Rococo forms were shells, and this fact gave the key to the origin and popularity of the style. It was a fashionable folly of the time to have rustic grottos lined with shells and supplied with fountains, statues of nymphs, &c. Not only were these to be found in gardens and basements, but also in connexion with suites of living-apartments. The vogue attained by these fanciful structures led to the adoption of these characteristic rustic and shell-like forms for ornamentation generally, so that Rococo was really a rustic or shell-work run wild. Passing on, they came to the third style—that of Louis Seize. This represented a reaction against the excesses of the Rococo style of Louis XV., and a return to the abandoned Classical forms of ornamentation. The contrast between Louis XIV. and Louis XV. style was not greater than that between the style of Louis XV. and that known by the name of his successor. It was especially marked in the general character of forms employed. Then, lastly, they had the taste for Classical forms pushed still further into the excesses of the period of the Directory and the Empire,—indeed, the feeling for the Classical was carried to a most extraordinary height. This was actually the time when scientific interest was being awakened in the remains of antiquity. There was a return to the political and social ideas of the Classical world at the time of the French Revolution, and society masqueraded in Classical guise. Napoleon persuaded himself that he was a successor of the Roman Cæsars. The result of this rage for the antique in art was a somewhat stiff and affected use of Classical forms without much elegance and charm. Such were the well-marked stages by which decorative art progressed during the period they were dealing with. These same stages were marked in the English furniture of the same century. They had in it no Louis XIV. period, though the much-praised Queen Anne style, with its semi-Classical elegance, corresponded in time with the close of the long reign of the "Grand Monarque." But they found the Rococo in considerable vogue in the middle of the eighteenth century, and a most decided reaction in favour of antique forms as they approached the year 1800. That year there was what was called our "Classical revival." It was not pushed to such pedantic extremes as in the France of the Directory and Empire, but used with very fine skill and taste by the brothers Adam, and by furniture-makers like Sheraton and Heppelwhite. The same "Classical revival" was marked in ceramic art by the famous Wedgwood-ware, in the designing and ornamentation of which the sculptor Flaxman bore so large a part. Proceeding to inquire what significance this history had for our own time, and what reflections were suggested by the artistic movement he had called the "Classical revival," the lecturer said "Classical revivals" would occur from time to time so long as the decorative arts were practised. A "Classical revival" meant a reaction from over-florid and meaningless ornament, and after every period when taste had become unduly free, and design careless or frivolous, they could safely look for a return to the purer models and the severer style of the antique schools. Simple, logical, rational—these words contained the secret of Greek decorative art. All decorative art which was of this character was so far Classical, though antique forms might not actually be borrowed. In a sense, Chippendale's simpler work was Classical, though he belonged to the period before the actual "Classical revival." He inherited the common Classical tradition of the Renaissance, but it was chiefly his thoroughness and consistency of work that seemed to carry his productions back to the age of antique art. On the other hand, Classical forms might be copied with the most rigid exactness, as in the French decoration of the Empire, while the work might miss entirely the true Classical charm. Antique ornamentation could take on different characteristics, according to the object to which it was applied. Severe and self-restrained when used in connexion with monumental structures like the Doric temples, it became bright, attractive, and fanciful in domestic life, or when employed on festal themes. The "Empire" style was too ponderous and formal. "Adam" decoration had a good deal of true Classical grace and cheerfulness; yet perhaps an interior carried out completely according to his own scheme would seem to modern eyes a little too pedantically correct, and too much a reproduction. It was not the duty of the modern designer to work out a "Classical revival" by a wholesale copying of Classical forms, even with the taste of an Adam or a Sheraton. "Classical revivals" should not be waited for till they were periodically forced upon us by the excesses or the carelessness of our artists and craftsmen. Artist and craftsman alike should learn to look upon the principles of Classical design as necessary daily food,—as a perennial source of artistic inspiration from which everyone should draw for daily use. For these principles were independent of special forms of ornament or systems of construction; they were based on immutable truths from which they departed at their peril. What were these principles? They had defined them generally when they called Greek decoration simple, logical, and rational. When a Greek set about designing, he considered (1) the general form of the object in relation to the use to which it was to be put, and the material of which it was to be made; (2) the structure of the object, and the choice and placing of the ornament in relation to that structure; and (3) the special character of the object as determining the decorative motives to be employed. Simplicity he secured by directness of construction, and a sparing use of well-selected decorative forms; while the logical and rational character of the ornamentation depended on the relation of ornament to construction, and the significance of the motives employed. The Greek methods of design and ornament were based on certain rational principles which all could comprehend and follow. There was no mystery, no necessity for special study. Let each one ask himself, "What am I making? How is it put together? What is its use when made?" and consider well what was involved in the answer to these questions. Such a one, if he acted on the suggestions he would thus obtain, would be treading in the footsteps of the Greeks, and would be working on Classical principles, whatever were the actual forms which he employed. The study of eighteenth-century art brought them, then, to the following result: They saw how good work in any branch, like some of Chippendale's, carried them back to the traditions of antiquity. They saw how a "Classical revival" followed of necessity on a time of licence and frivolity; but they might receive a more important lesson still if they got home the truth firmly into their minds, that the principles on which the Greeks worked were just as valid for us to-day as they were for the countrymen of Plato. If they mastered these, and referred back to them continually in daily work, they might be reaping the benefit every day of a true "Classical revival."

The fourth lecture of the series was delivered on the 27th ult. by Professor W. Ramsay, Ph.D., F.R.S., the subject being "The Ventilation of Buildings through their Walls." Mr. J. T. Preston, Past Master, presided, in the absence of Mr. Charles Barry, F.S.A., F.R.I.B.A., and the attendance was again large. We are compelled to hold over our report of this lecture, as well as that of Mr. Banister Fletcher's lecture, delivered on Wednesday evening last, when Sir John Lubbock was in the chair, and there was again a good attendance.

DRAWINGS FOR THE ROYAL ACADEMY.

As in former years, we shall be glad to receive, and deliver at the Royal Academy on the appointed day, any drawings which their authors may wish to have photographed for publication in the *Builder* after the Academy Exhibition is open.

All drawings sent with this object must, however, be provided with a title label affixed at the back of the frame, and another attached by a string, in accordance with the Royal Academy regulations, and must be accompanied by the letter of description on the required form, addressed to the Secretary of the Royal Academy, and signed by the sender of the drawing in his own handwriting.

Illustrations.

THE TOWN HALL AT LINDAU.

LINDAU is a small frontier town and fortress of Bavaria, and is built upon an island in the Lake of Constance, connected with the mainland by bridges more than 1,000 ft. long. The Romans under Tiberius are believed to have swept Lacus Brigantius with a fleet, and to have constructed a fort on this island, fragments of which are still standing. Certain it is that Tiberius and Drusus set out from hence on their expedition against the Rhœti and Vindelici. In 1275, Lindau became a free Imperial city; indeed, the thirteenth century was the period of its greatest prosperity; and although extensive fires played havoc with its more important buildings, there is still much Romanesque and Gothic work left to interest any architect on a tour to or from the Tyrol. Among the best of these remains are the churches of the Barefooted Friars and of St. Peter, the Town Hall, the subject of this article, and certain quaint "bits" in various parts of the town. The Town Hall, erected in the years 1422–1436, stands free on all sides, three sides being bordered by lanes, whilst the front faces the market place. The dimensions of the building are 72 ft. by 51 ft., the longer sides carried up in stepped gables to a height of 81 ft. Originally, the north and south gable-ends were precisely alike; in each there was the central doorway with two windows on each side, next a continuous row of square-headed and mullioned lights, and then three, two, and one windows in the gable; in fact, very much like the south view we publish to-day, but, of course, without its ornamentation, although some surface decoration must have existed even then or soon after, because we read that the front was "*again* painted with pictures" in 1540. In that year the building underwent considerable alterations; the inside staircase was taken down, and the present outside one was erected. The general arrangement of this staircase so strongly reminds one of the one at Lubeck, which was built about the same time, that it is probable that the architect of the latter visited Lindau, and, taking note of what he saw there, reproduced the idea on the banks of the Trave, but with such modifications as the more northern latitude of Lubeck required. In 1618 it was again restored, the façades were "splendidly" painted by Master Linderer, of Nuremberg, and the top of the northern gable received a new two-storied bell-cot. In 1724 the building was once more restored, the "restoration" apparently consisting in white-washing all the internal paintings and decorations. The exterior was suffered to remain as it was until 1865, when the northern face was very considerably altered for the worse, the southern one, however, being permitted to remain as before. Finally, in 1885, the German Consul at Corfu and two other gentlemen of Lindau agreed to pay for a thorough restoration, and the work was entrusted to Prof. F. Thiersch,

THE BUILDER, MARCH 9, 1889.

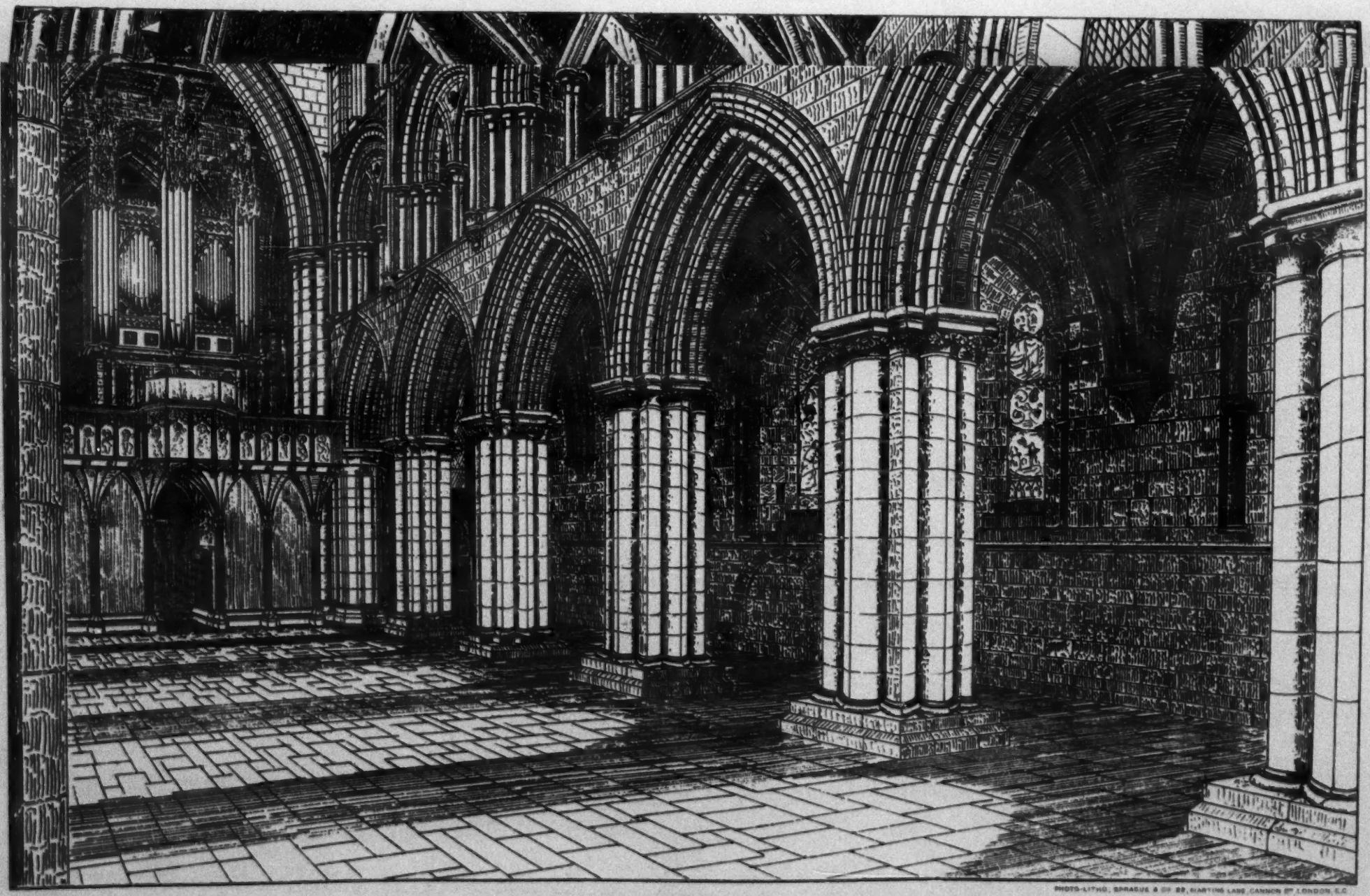
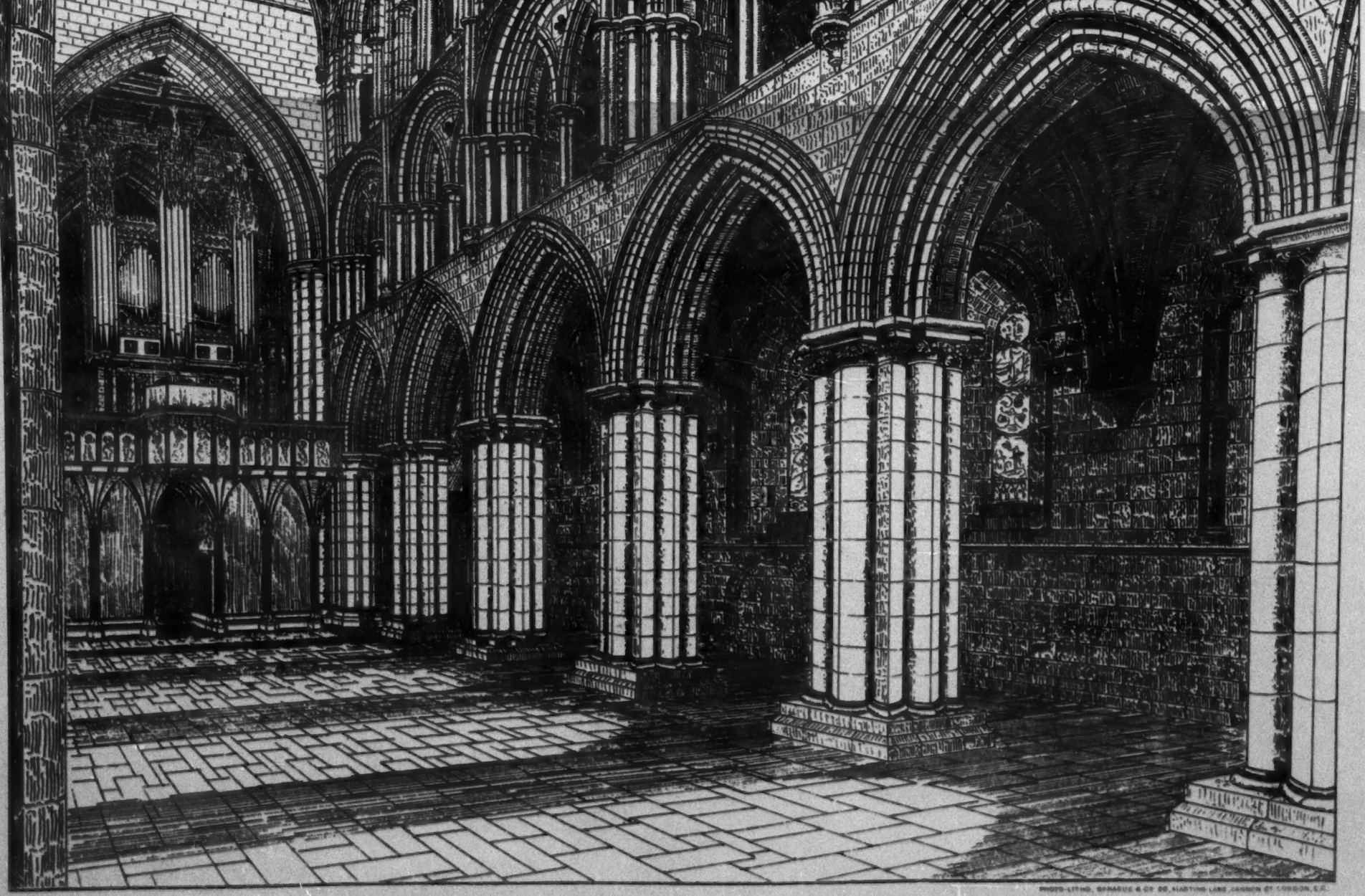
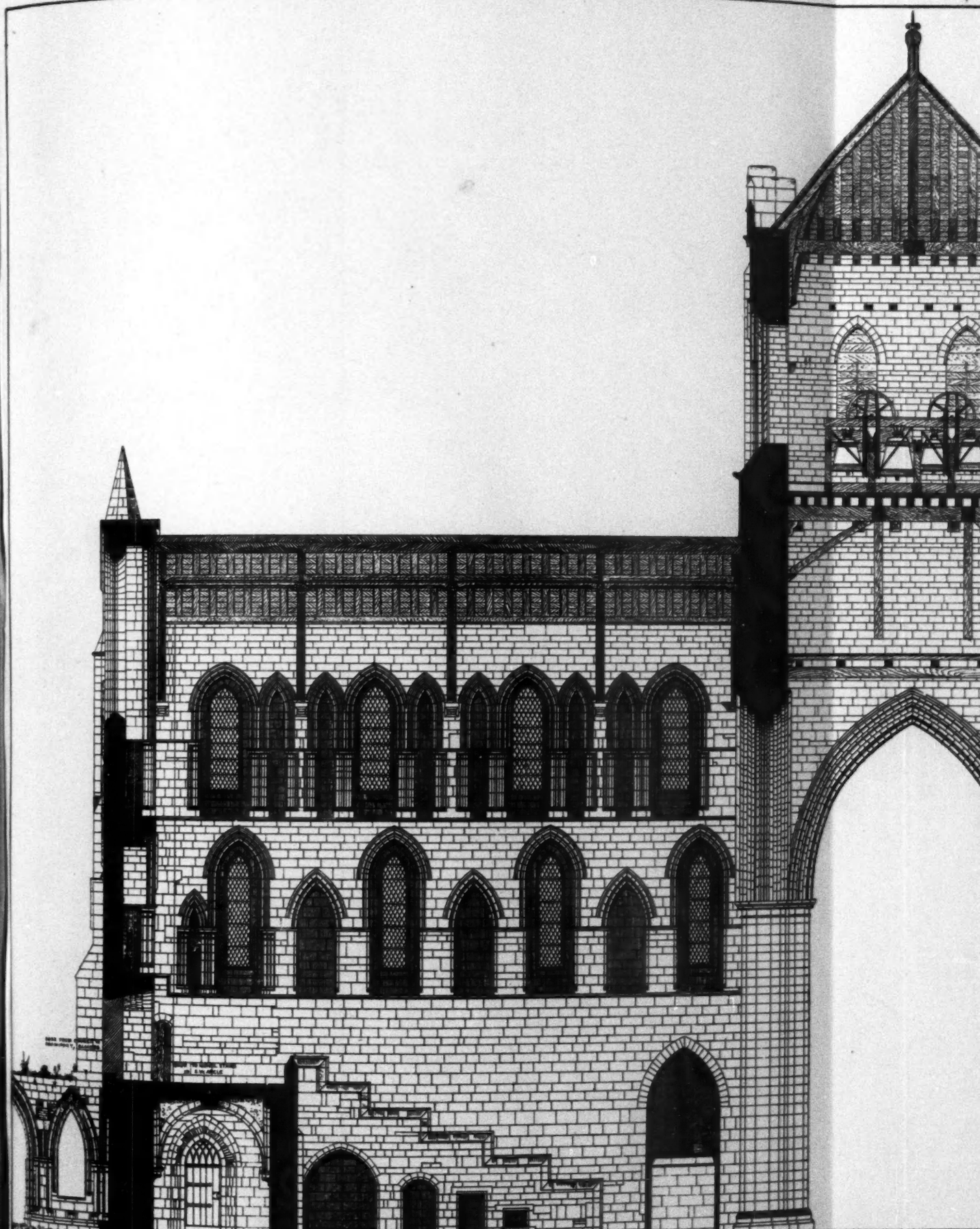


PHOTO-LITHO. SPRAGUE & CO. 22, MARTINS LANE, CANNON ST. LONDON, E.C.

HEXHAM ABBEY CHURCH: VIEW OF THE CHOIR, LOOKING WEST.—Drawn by Mr. C. Clement Hodges.



HEXHAM ABBEY CHURCH: VIEW OF THE CHOIR, LOOKING WEST.—Drawn by Mr. C. Clement Hodges.


SLYPE
NIGHT STAIRS TO THE DORMITORY
DOOR LEADING TO CLOISTER.

Naxnam Abbey

Section through Transepts

LOOKING WESTWARD

SCALE OF FEET

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Measured & Drawn by
Mr A. Clement Hodges.

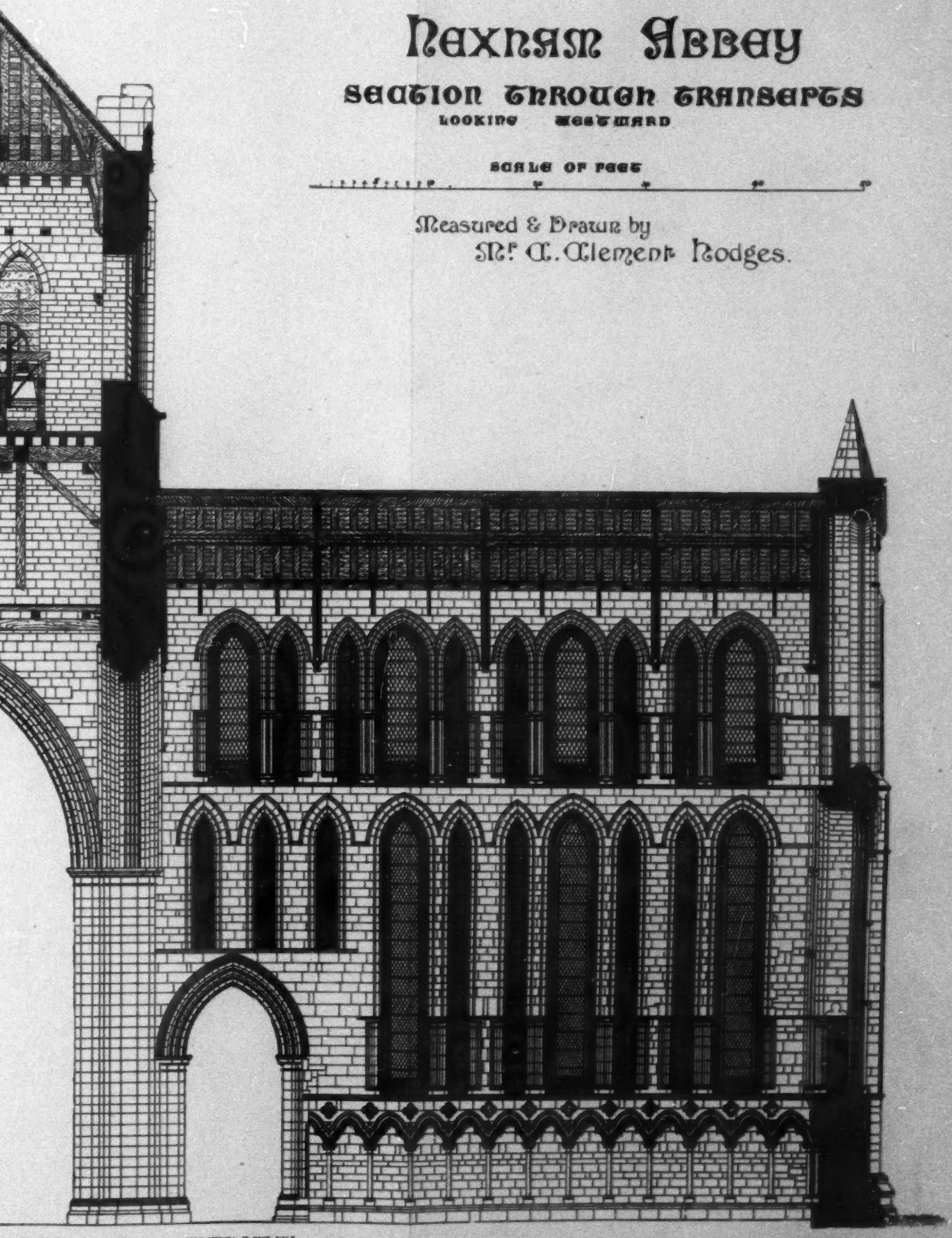

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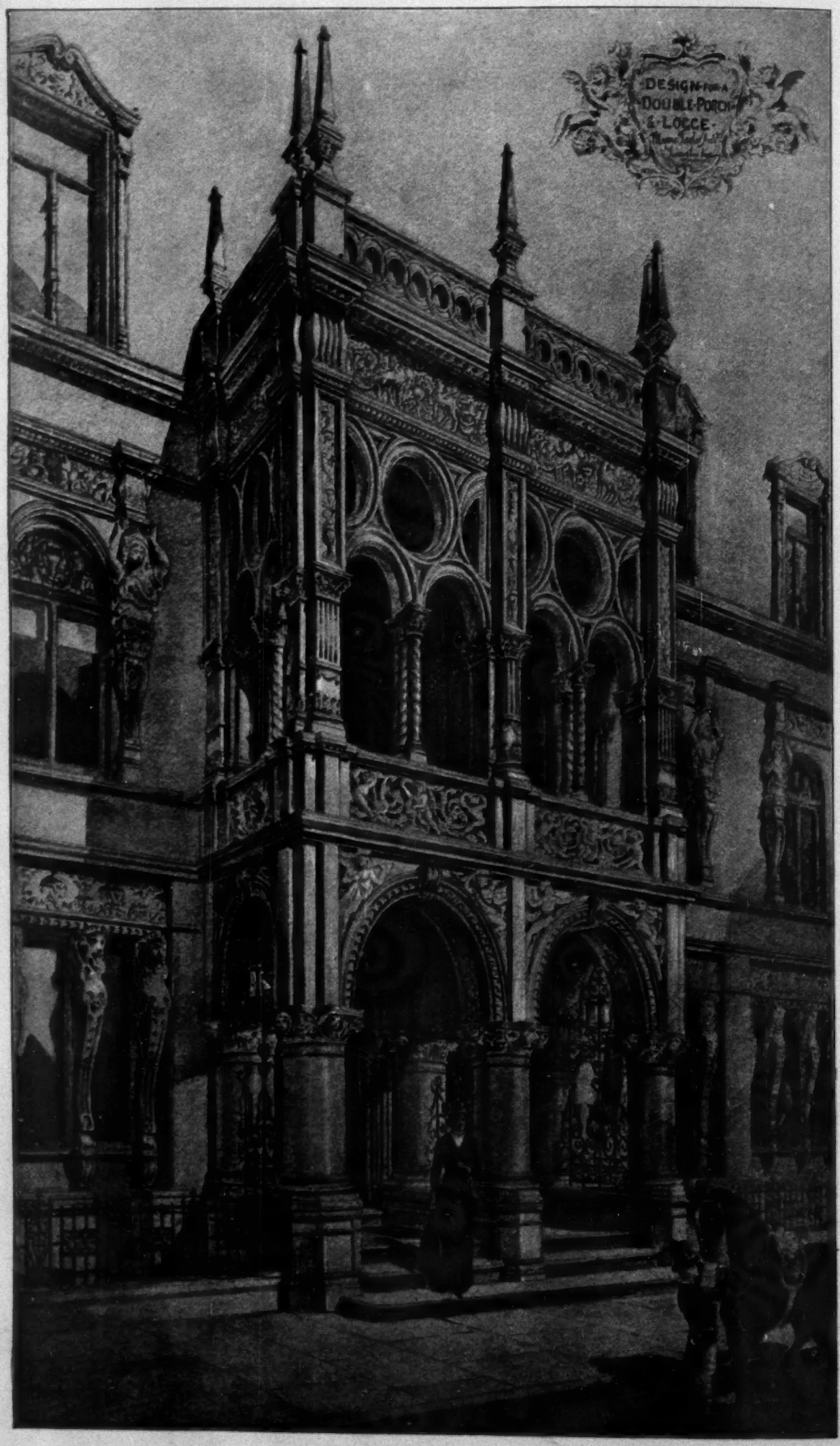
PHOTO-LITHO. SPRAGUE & CO. 20, MARTINS LANE, CANNON ST. LONDON, E.C.

"AK-PHOTO" SPRAGUE & CO. 62 MARTINS LANE, CANNON ST. LONDON, E.C.

THE TOWN HALL, LINDAU, BAVARIA: AS RESTORED.—Professor Thiersch, Architect.

NORTH FRONT.



The Phototype Co., 33, Strand, London.

The Phototype Co., 233, Strand, London.

DESIGN FOR STAINED GLASS WINDOW.

By Mr. J. J. WRATHALL.

THE TOWN HALL, LINDAU, BAVARIA: AS RESTORED.—PROFESSOR THIERSCH, ARCHITECT.

SOUTH FRONT.

architect, Munich, ably assisted by the painter, Herr Josef Widmann. Although traces of former outside painting were found, there was not enough to make a restoration possible, and, therefore, an independent and entirely original design was decided on, the artist being in a measure guided by the curious paintings on the well-known house at Schaffhausen, the date of which is 1570. The frieze at the base of gable is about 4 ft. high, and represents, on the south side, the entry of Philip the Handsome of Burgundy, father of King Charles V. Within the gable are a clock and a sun-dial, a Mediæval ship, and a figure of an angel between the windows, with the motto "Hic justitiæ et pietatis sedes," whilst all the windows are surrounded by fanciful decorations, intended to break the stiffness of the architectural lines. On the northern face the subject of the frieze is a public holiday, which permits the introduction of a number of inhabitants clad in the picturesque fashions of the sixteenth century. In the gable there is another clock, balanced by a Neptune (for the Lake of Constance), a knight with banner, and a column of Victory, with the motto "Soli Deo gloria" over the middle window. The panels on the stairs and on the square projecting vestibule are left plain as yet, their ultimate decoration being for the present deferred. All the paintings were executed in water-colours on the dry plaster and protected by potass "waterglass."

HEXHAM ABBEY.

WE give this week two further illustrations of Hexham Abbey, from the drawings of Mr. C. C. Hodges, the author of the fine monograph of Hexham Abbey, which was reviewed at some length in the *Builder* for December 29, 1888. The one shows the perspective view of the choir, with the seats and modern additions omitted. The other is the section through the transepts, looking west, showing the section of the interior slype, and the stair up to it against the west wall, and the fine treatment of the design of the west wall on the north side of the crossing, to which we referred in the review of the book.

PORCHES FOR PROPOSED HOUSES IN QUEEN'S-GATE, W.

THIS perspective is intended chiefly to illustrate a proposed arrangement of porches and loggie, for houses in Queen's-Gate. The illustration represents the original design which was prepared by the architect, but which will be modified in execution. The architect is Mr. Myers Taylor.

DESIGN FOR SINGLE-LIGHT WINDOW.

THE subject of this window is the "Assumption of the Virgin," treated in an original manner.

The Virgin is draped in a blue mantle, and is surrounded, outside rays of glory, by a ring of cherubs, whose wings are arranged in place of the usual architectural canopy, and form a rich diaper of varied rubies and low-toned greens; above are two angels holding a crown.

The outer border is of a geometrical character, and beneath is an ornamental panel with an inscription in the centre.

The design is by Mr. J. J. Wrathall, and was exhibited in the last Royal Academy Exhibition.

The Institute of Builders.—At a meeting of this Institute, held at its offices, 31 and 32, Bedford-street, Strand, on the 5th inst., Mr. Thomas F. Rider in the chair, Mr. Joseph Randall (of the firm of Kirk & Randall) read an important paper on "The Inclusion of Provisional Amounts in Contracts." We are obliged to hold over our report of it until next week.

An Important Light and Air Case.—The case of "The Attorney-General *v.* The Queen Anne's Mansions (Limited)" came on for hearing, on the 2nd inst., before Mr. Justice Stirling. The Crown applied for an injunction against the defendant company restraining them from erecting a lofty block of buildings to the south of the Guards' Chapel in Birdcage-walk, St. James's Park. A large number of affidavits on both sides were read, and the case was adjourned. We will give a report of the case when the hearing has been concluded.

OSNEY BRIDGE, OXFORD.

THIS bridge, which crosses the main channel and one of the back-water streams of the river Thames, was recently opened for public traffic. The engineer of the work sends us the following account of it:—

The bridge is in substitution for a narrow stone bridge of five arches, which was undermined and partly carried away by the floods three years ago.

During the interval the road traffic had been accommodated by a temporary timber bridge, erected about 100 yards lower down the river.

Owing to the protracted negotiations between the parties interested, involving some legal proceedings, it was not until January last that the work of taking down the remains of the old bridge, preparatory to the erection of the present structure, was commenced.

The new bridge has one main opening of 60 ft., spanned by cast-iron arched girders, and there are two smaller stone arches over the back-water.

The cast-iron ribs are six in number, 18 in. deep at the crown, and increasing to 22 in. at the springing, the curvature increasing from an 80 ft. radius at the crown to a 40 ft. radius near the springing.

Each rib springs from a strong cast-iron bed-plate, and has a rise of 7 ft. The two outer ribs are ornamented by mouldings, and the spandrels are open. Each rib is in three segments, with planed joints, bolted together with heavy wrought-iron bolts. The cross bracing consists of six sets of light steel girders, with steel end-plates, and one set of diagonal bracing near each end.

The floor is Lindsay's patent flooring, consisting of steel splay channels, each rolled in one length to the full width of the bridge, and reversed on each other, rivetted together, and bolted down to the top flanges of the cast-iron ribs. The corrugations of the flooring are filled with cement concrete, which is brought to a uniform level two inches above the upper surface of the steel, and coated with half an inch of asphalte, to receive the road-metalling.

The parapet railings are of an ornamental geometrical pattern, each railing having in the centre a shield, bearing the arms of the Local Board on each face, and the end pillars are surmounted by cast-iron columns and lamps. The railings and lamps were manufactured by Messrs. Macfarlane & Co., of Glasgow.

The weight of cast-iron in the main span is about 69 tons, of wrought-iron 1½ tons, and of steel 20 tons, and the total dead-weight imposed upon the main abutments (including road-metalling and paving) is calculated at about 210 tons. The greatest live-weight which could be added would be about 100 tons.

The abutments and wall wings are built in coursed rubble work, the stone being mostly that taken from the old bridge; the main abutments are rock-faced, with tooled ashlar quoins and strings, and the parapets are in solid ashlar. The whole of the ashlar and the rock facing of the abutments is in Matlock stone. The wing walls and the end pillars are built to a curved batter.

The foundations are entirely encased in 6-in. sheet-piling driven through the gravel into the Oxford clay, and the pile-heads cut off several feet below the river-bed. The space within the piles was excavated to a depth of 3 ft. 3 in. below the pile-heads, and filled in with cement concrete. Great difficulties were met with in this portion of the work, owing to hard concretions in the gravel through which the piles were driven, and to heavy flooding with subsoil water from the course of one of the main sewers which syphons under the river close by the bridge. A delay of at least two months was due to these causes.

The overflow-weir adjoining the bridge was reconstructed, and three openings, 4 ft. 6 in. wide by 9 in. deep, were made in it, and provided with sluice-boards, for the better discharge of flood water from the main river.

The approaches, which were formerly very steep near the bridge, have been so modified as to give a uniform gradient of one in twenty-six up to the crown of the bridge. The clear width of the bridge, between the parapets, is 30 ft., divided into a 20-ft. carriage-way, and 5-ft. paths.

The engineer for the works was Mr. W. H. White, M.Inst.C.E., the contractors for the ironwork being the Horseley Company, Tipton, and for the abutments and remainder of the works, Mr. W. J. McKenzie, of 5, Victoria-street, Westminster.

The total cost of the works, including the temporary bridge, was, approximately, 4,500*l.*

THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN:

PRESENTATION TO SIR EDWIN CHADWICK, K.C.B.

THE sixth annual dinner of the Association of Public Sanitary Inspectors of Great Britain was held on Saturday evening last at the First Avenue Hotel, Holborn, advantage being taken of the occasion to celebrate the attainment of the 90th year of his age of Sir Edwin Chadwick, the President of the Association, who has within the last few days received the promotion to the Order of Knight Commander of the Bath from the Queen. Dr. Benjamin W. Richardson, F.R.S., occupied the chair, and was supported by the Earl of Aberdeen, Earl Fortescue, Sir Lyon Playfair, Sir Spencer Wells, Sir Richard Owen, the Hon. D. F. Fortescue, Dr. Buchanan, Sir Douglas Galton, Mr. Wyke Bayliss, Dr. Farquharson, M.P., Dr. Cameron, M.P., Mr. Hugh Alexander, Dr. A. Carpenter, Mr. B. Carter, and others. Letters excusing absence and cordially congratulating Sir Edwin Chadwick were read from the Duke of Westminster, the Earl of Meath, Mr. J. F. B. Firth, and other gentlemen.

The Chairman, in giving the loyal toasts, expressed the gratification they all felt at the honour conferred upon Sir Edwin Chadwick by the Queen, adding that they all revered him as the champion of health, the Cato, the wise man of England.

The Earl of Aberdeen, responding for the "House of Lords," also spoke of the pleasure he felt at being able to do honour to so worthy a man as their venerable guest. Sir Edwin Chadwick, he said, was the revered father of Poor Law reform and of sanitation, and was one of the original founders of what might be called the present system of Poor Law administration, owing, no doubt, to his membership of the great Commission on the condition of the sanitation of the labouring classes, in which he took the most energetic and conspicuous part.

The Chairman then, on behalf of the members of the Association, presented their guest with an illuminated address in commemoration of the attainment of the 90th year of his age, which read as follows:—

TO SIR EDWIN CHADWICK, K.C.B.

"We, whose names are appended to this simple but earnest Memorial, beg, on behalf of the members of the Association of Public Sanitary Inspectors of Great Britain, over whom you have so generously and ably presided since the foundation of the society in 1883, and of your many friends and fellow-workers in sanitary science at home and abroad, to tender to you our sincerest congratulations upon your entry into the ninetieth year of your life, and the seventieth of your active public career.

We should consider it an event historical in character for any one of our friends and contemporaries to have distinguished himself during so long a period in the promotion of any work of public utility; but, when we recall the labours which you have performed, and the objects of those labours,—namely, the health of this nation and of other nations, and therewith the happiness, prosperity, and advancing civilisation of peoples everywhere, for all future generations,—our pleasure is the greater, not only that one so gifted as yourself should have laboured towards the accomplishment of such extensive and lasting goodness, but that we who have witnessed your efforts should have had the opportunity of testifying to the industry, courage, and enthusiasm, continued to the present hour, by which your efforts have been characterised, and which, from opponents as well as from friends and allies, have long commanded the respect and admiration which are ever accorded to those in whom genius for original observation and suggestion is combined with earnestness of purpose and consistency of action.

We consider that on your early labours in sanitation, especially your report on the sanitary condition of the labouring classes, and your introduction of the half-time system of education, the present advanced state of sanitation largely rests. And in thanking you for all you have done in the past for the health and happiness of mankind, we pray that your own health, hitherto so conspicuous an example of good sanitation, in its fullest strength and activity, may still long be preserved with every happiness that should to the last attend so honourable, honoured, and useful a life."

The address was signed by all the noblemen and gentlemen named, and by others to the number of ninety or a hundred in all.

Sir Edwin Chadwick, in his reply, mentioned that he probably owed the duration of his working ability to exceptional hereditary vitality, for his father had died at the age of eighty-four, his grandfather at 95, and his two great-grandfathers had lived to be centenarians. As to sanitary improvements, he said death-rates in towns under the separate system of drainage had been reduced by one-half through the work of the sanitary engineer

alone, and the life-rate of all classes had been extended by seven or eight years. This extension of life had been assisted by, especially among the working classes, model dwellings, the inspection of factories and schools, and other work of the sanitary authorities. Disease and sickness had also been vastly reduced. What proper sanitation could do might be seen from the fact that the death-rate in the Indian Army used to be sixty-seven in a thousand, and that since the appointment of the Sanitary Commission by Lord Stanley (the present Lord Derby), in 1859, the rate had been reduced to twenty in a thousand. He urged sanitary engineers to turn their attention to the bringing of fresh air from above into our crowded communities. He then proposed "Success to the Association and its Executive," to which Mr. Hugh Alexander and Mr. E. Tidman responded.

Other toasts followed.

THE PROPOSED ADDITION TO WESTMINSTER ABBEY.*

SIR,—Your leader of February 23rd on this subject coincides with a discussion on February 21st at the Society of Antiquaries. Much the same view as yours was taken there, though the question was not so exhaustively treated.

I then took occasion to point out briefly the very crude form of the proposal. Had the space proposed to be taken been coloured pink on the plan and scheduled as "Land to be acquired" for the purpose, the scheme might have passed muster with some modifications. Instead of that, one great Hall is shown occupying the space.

It is difficult to believe that any architect can have had to do with such a proposal.

Apart from the objections you have pointed out, nothing could possibly be more unsuited for the display of monuments than a great hall or nave, which would provide the minimum of accommodation.

The natural treatment for such a piece of ground as that shown in the scheme would be to build a succession of chapels opening out of each other. These would afford plenty of wall-space and picturesque corners, and would be of such proportions as would neither interfere with the scale of the Abbey nor that of the monuments to be placed in them.

I think there is good ground for the opinion expressed at Burlington House, that it is important to defer to the religious sentiment by making the addition a chapel and not a cloister, and there are certainly strong objections to allowing any tampering with the old cloisters.

Personally, I think the north side a very suitable place for a small ornate chapel, such as would suffice for the use of the next hundred years. Such a chapel could, however, be equally well placed adjoining the Chapter House.

Surely we should leave something to the coming centuries, and especially since, as Gen. Pitt Rivers pointed out, by that time, cremation may have become not only customary but obligatory.

Anything built for the purpose must necessarily have plenty of plain wall-space, and must, therefore, till after the lapse of centuries present a bald, cold, and cheerless appearance.

I believe the average rate of interments is about one a year, and it is certainly not desirable to make the honour too cheap. It is obvious, therefore, that a very small building will suffice for a century.

RALPH NEVILL, F.S.A.

SIR,—I have read with much interest the article in the *Builder* of Feb. 23 on the above subject.

I read a paper on the same subject on the previous Thursday before the Society of Antiquaries, on which occasion the Dean of Westminster and Mr. Shaw-Lefevre were present and spoke. I had to enter as fully as I could into the whole matter, and I find there is a great amount of misconception as to what are the practical difficulties which have to be dealt with in finding a place for a memorial chapel.

Honouring the departed by burial or commemoration in Westminster Abbey Church being in itself a matter of sentiment, I believe it to be of the first importance that there shall be as little break as possible between the old and the new. Now, we all know what a cloister is. It is a place outside the church. To bury in it would be a new departure.

The building we require is something that shall partake of the nature and likeness of the church, and therefore be less of a new departure.

Being Englishmen, we do not want Campo Santos, Pantheons, or other outlandish things. It is, too, very essential that the place should be covered in. Its stateliness and beauty must be within itself, whereas the charm,—indeed, I go so far as to say the only charm,—in the Pisan Campo Santo, as a building, lies in the open traceried windows. Glaze these and the place is but a shed.

Or, if we take the much more beautiful cloisters of Northern Europe, half their charm would be lost by glazing their openings. They become ornamented passages or corridors. The museum comes at once before the mind.

Feeling as I do, and very many with me, that something in the nature of a chapel attached to Westminster Abbey Church is the only satisfactory solution of the difficulty, I believe that nothing will be found so good as Mr. Shaw-Lefevre's scheme, always provided that it be so modified as to destroy no part of the old building; and Mr. Shaw-Lefevre has stated that he does not tie himself to push forward the scheme unmodified.

The use of the existing cloisters can, I think, be proved impossible, although at first sight there may seem something attractive in the idea. The cloisters are in their east, south, and west walks, passages, as they always were, common in a greater or less degree to the use of the whole establishment. Through the south walk, which is only 12 ft. wide at the vaulting shaft, the coals, furniture, tradesmen, and all the various requirements of seven houses have to pass, and there is no alternative way. The western walk is one of the highways into the church. On the occasion of great ceremonies, musical services, &c., the cloisters are simply crammed with people, and unoccupied as is their floor-space they are all too small. The walls are already encrusted with tablets, and without wholesale moving of those that are there no fresh space could be found. Glazed in, they would become stuffy corridors; not very large.

I should like to be permitted to show what are the objections to Mr. Shaw-Lefevre's scheme as it stands, and how a modification of it would fulfil all that is required.

You have already referred to my letters in the *Builder* in 1884. On the plan accompanying these the ancient buildings that would have been utterly destroyed by Mr. Fergusson's scheme, and would be only a little less damaged by Mr. Shaw-Lefevre's, are clearly shown.

The remains of St. Katherine's Chapel are ruinous, and are not accessible to every one; but their value is not lessened, as some seem to suppose, by this; indeed, the less that remains the more to be valued are the parts that are left. To pretend to incorporate these remains with the new chapel, as hinted at in Mr. Shaw-Lefevre's plan in the *Nineteenth Century Magazine* of November last, is absurd. The old school of restorers are, of course, prepared to undertake anything, and the sham antique is considered quite as good as the real article. One thing is certain. When the incorporation of the remains of St. Katherine's Chapel might be completed St. Katherine's Chapel would have ceased to exist.

Then, the Little Cloister, with its view of the Victoria tower, would be entirely ruined. Not only would the great chapel standing north and south block it up on the eastern side, but the houses that were not demolished by the new building would be hardly habitable, so gloomy and shut in would the cloister become.

With one exception, each of the doomed houses on the east side of the little cloister has more or less of interest and picturesque antiquity about it. When these are knocked down, are others to be built in the College garden?—an open space that can ill be spared. The two very incongruous-looking houses that have already been built there are a sufficient blot.

The unnecessary dimensions of Mr. Shaw-Lefevre's proposed chapel are the cause of the possible destruction, and if these dimensions be modified no harm need be done. The chapel shown on his plan covers, according to his own statement, 18,000 superficial feet. The nave of the Abbey Church from the west door to the choir door has a superficial area of 11,300 feet. The whole western limb of the Church from the lanthorn tower to the west doors covers 15,200. What centuries would it not take to fill such great, lonesome places? A chapel covering an area of 10,000 feet and more could be built on the north part of Mr. Shaw-Lefevre's proposed site, and it would have the great advantage over his scheme of standing east and west.

As a matter of carrying on the continuity of tradition, of making the least possible change between the old and the new, this is not to be despised; but, as a matter of fact, a building of the nature of a church is never so artistically or effectively lit when it stands north and south as when the light steals along from east to west. This is capable of demonstration.

There are many more points that could be raised, but I must close this all-too-long letter.

SOMERS CLARKE.

15, Dean's-yard, S.W., Feb. 26, 1889.

* This and the following letter were sent for last week's issue, but were unavoidably held over through want of space.

Provident Institution of Builders' Foremen.—The Finance Secretary of this Institution writes:—"In your report of the annual dinner of the above Institution, it is stated that the age was over forty-five before joining; it should be that no one is admitted over that age." The mistake was not our reporter's.

THE ENGLISH RENAISSANCE.

SIR,—In the very interesting paper you print last week on the English Renaissance, by Mr. J. M. Brydon, I see repeated that in the thirty-five years of the building of St. Paul's, it was under the superintendence of one architect, one mason, one bishop. Even Elmes, Milman, and Miss Phillimore do not put this right. Cunningham's admirable "Handbook" helps to circulate the error. Pretty as the fabrication is, let me try to stop it; nothing is truly pretty that is contrary to fact. Hinchman was bishop when the first stone was laid, and died the same year. Compton succeeded and was alive at the completion. So there were two bishops' lives involved. Also there were two masons. Strong, senior, who laid the first stone and built St. Stephen's, Walbrook, died about the middle term, and Strong, junior, his son, laid the last stone of the lantern with Wren's son, so that two masons' lives were involved. The circumstances even thus are quite remarkable enough, but the pretty coincidence disappears.

Kent did not build the Horse Guards, but Vardy. The design is said to have been Kent's, but was it? Vardy was quite equal to it. The best house exterior of modern London, Spencer House, is by him, and utterly snuffs out Barry's work adjacent, at a quarter the cost.* Vardy was an excellent man who has unduly escaped notice.

I am busy upon Wren's life-work. I will not say life, for he has none out of his work, nor has any true artist as a rule. I should be greatly obliged if your professional readers would indicate to me the best criticisms, English and foreign, upon St. Paul's.

C. A. WARD.

Walthamstow.

HIGH-PRESSURE FIRE MAINS.

SIR,—I have only just seen in your issue of January 12, under the head of "Notes," the observations you did me the honour to make on my high-pressure fire-main system.

Whilst thanking you for noticing the system, I feel sure you will permit me to offer some explanation with regard to the doubts you express as to the reliability of the system for extended periods of time, and as to its suitability for private buildings, on the score of cost and difficulty of charging; otherwise your notice, though doubtless prompted by a very proper and natural caution when speaking of a novel and apparently untried system, would spread a very erroneous impression on a subject of perhaps considerable interest to your readers, and certainly of great importance to me.

It may surprise those unacquainted with the facilities afforded by recent manufacturing methods to learn that air and gases can be maintained under high pressure without leakage, but it is nevertheless the case that, with good workmanship and material, there is no difficulty whatever in maintaining the air-pressure in the cylinders of my high-pressure apparatus absolutely without any leakage whatever for any length of time; indeed, up to pressures eight to ten times as great as that required in this fire-main system, compressed air can be maintained without any leakage with the greatest certainty.

Of course, like all human devices, it is liable to accidental defects; but that leakage would be the very rare exception is so certain, that I am prepared to give substantial guarantees that it shall not occur.

The installation to which you refer, that at the South Kensington Museum, was the first one erected on a large scale, and with valves and leads giving so great a discharge as 200 gallons a minute (the delivery of a powerful steam fire-engine), at 100 lb. pressure, and this entailed a good deal of work of quite a novel character; and I think it speaks well for the reliability of the pressure that after the first month's trial and regulating of the numerous connexions, &c., only one defect in the apparatus, causing leakage of air, has occurred (about four months after it was erected) during its fourteen months' use. This was at once shown by the pressure-gauge, and was easily rectified, and the authorities are so satisfied as to the trustworthiness of the pressure for use at a moment's notice on emergency, that they have neither then nor since deemed it necessary to provide an air-pump for occasional re-charging at intervals, which their possession of extensive steam-power gives them every facility for working, but trust to my method of charging the air-cylinders by means of my portable high-pressure air-vessels, whenever re-charging may be necessary. This meets your apprehension that the system is unsuited for use in private houses that are unprovided with steam-power, as these portable, high-pressure vessels can be as easily used at a distance as in London.

The system cannot correctly be termed a "pumping power" (as you speak of it), one of its advantages being that, when used, there are no strokes of a piston or bucket,—indeed no working parts in the ordinary sense,—so that a long period of neglect,

* We agree that the Park front of Spencer House is a very powerful design of its type; but is it so like a mansion, a dwelling-house, as the adjoining building of Barry's referred to? Is there not too much of the temple or town-hall about it? The front to St. James's-place has not much to recommend it.—ED.

and rust, and dirt accumulation can have no effect upon the expelling power of the compressed air.

The danger which you supposed to be possible of the air-pressure filtering down *imperceptibly* is rendered extremely remote by the provision of a pressure-gauge, which should be placed in the entrance hall or some spot daily frequented by the heads of the establishment, so that the slightest leakage of air is at once seen. This gauge performs another important function: it shows that the tank is full of water, which can only be expelled by the expansion of the air and the consequent falling of the gauge. The system thus lends itself to the elimination of two serious dangers attending the usual roof and tower-tank methods, viz., *an empty tank* and a *frozen tank*, besides providing a fire-engine pressure.

As to cost, I may say that, within certain limits as regards the quantity of water stored, the expense is in most cases far less than,—in some instances less than one-fourth,—that of placing tanks in water-towers or other elevated positions,—assuming, of course, equal quantities and equal pressures; so that the system greatly frees the hand of the architect when considering the question of water-towers and roof-tanks.

The official report of General Festing, R.E., to be found in the 1888 Blue-book, or "Report of the Department of Science and Art," will be found to confirm much of the above, and to give other information; and I may add that the water-tower there spoken of as having been in contemplation would,—if put up to contain only 2,000 gallons of water at 100 lb. pressure,—have cost four to six times as much as the high-pressure system, and could hardly have failed to present an appearance,—very much that of a factory chimney,—that would have justly aroused the indignation of the *Builder*.

M. VINING,
R.N. Retired List.

19, *Great Winchester-street E.C.*

*** We have referred to the passage in the report of the Science and Art Department in which the system as installed at South Kensington and Bethnal-green Museums is commented on; but we gather from it that the Department, like ourselves, regard it with a certain attitude of caution. They say, "The proper action of the regulating valve and the soundness of the air reservoir are, of course, the essentials of the system. The former was tested with satisfactory results in trials made before the apparatus was taken over. Time only can test the latter; so far there is no sign of any loss of pressure."

MR. RICKMAN'S PAPER ON SPECIFICATIONS.

SIR,—I hope that you will allow me to correct a slight error in your report?

What I really intended was, "It was *not* certain that the word "supply" would always meet the case, and a builder might argue that he had not to fix."

And in the last paragraph, I meant to imply that the writing of a specification was not a pleasant job; that most architects preferred making drawings.—Yours, &c., HENRY LOVEGROVE.

The Student's Column.

TOWN DRAINAGE.

X.—DRYING THE GROUND.

WHATEVER difference of opinion at various times there may have been on some points of house drainage, it has always been considered desirable to drain away the water in the ground of the site of houses. There is an exception in the case of a running sand, which, if an outlet for the great quantity of water it contains were suddenly made, might endanger the stability of buildings by the contraction of its bulk when relieved of its pressure of water; but in all ordinary cases of mere soakage of water out of the ground into a drain, it should be provided for, and an outlet made so as to permanently lower the level at which the water has usually stood in the ground, when that level is nearer the surface than, say, 7 ft. or 8 ft., so that basement floors may be at all times kept dry, rather than adopt means to exclude the surrounding water; and even where there are no basement floors or cellars, it is desirable to lay dry the ground immediately beneath a house and around it. But the ground-water cannot be admitted to the drain at any of the joints, these being water-tight. Seeing the great importance of providing for the admission of ground-water into a drain, the joints were at one time left open in the upper part, being made water-tight only in the lower portion of each joint, up to the middle of the pipe. Ground-water does not run into a drain from above; it first sinks below the level of the drain, as far as the nature of the ground allows it to sink; and then, when an outlet is made for it by laying a drain and leaving the upper part of the joints open, it rises occasionally to that level, but no higher, after the ground above it has been once dried.

But there has arisen, very properly, a system of testing drains after they are laid,—long after, sometimes,—in cases where complaints are made of leakage without knowing where it occurs. The drain is tested by filling it with water. Suppose that an intercepting-trap has been at some time placed in a house-drain, but that nothing more has been done, the trap having been considered to be all that was necessary, with, perhaps,—or perhaps not,—some attention to the ventilation at the other end of the drain. In this case, if a proper chamber has been constructed along with the trap, the examiner of the drain, acting under the general instructions of those who have complained, proceeds to stop up the end of the drain temporarily, going then to the back part of the house to another opening, or making one for the purpose, and pouring in water until it makes its appearance at the upper opening, which it will do if the joints are watertight all round the pipe. But if they have been made so only in the lower half, the upper half having been left open to dry the ground, the examiner cannot ascertain by this water-test whether that length of drain is good or not. He certainly may do so by a levelling operation, providing the fall in that length of drain be not more than half the diameter of the pipe; but this method could not be adopted in all cases.

If then the joints are made (as on this consideration they must be) completely watertight, so that they neither let out sewage below nor let in ground-water above the middle of their height, it becomes necessary to lay separate drains for drying the site of the house, and the junction of these with the main house-drain must be made on the upper side of the intercepting trap. This, in one respect, fixes the depth of the house-drain at that point. It must be deep enough there to receive the ground-water drain. The junction with the house-drain may be made at any point above the trap, but the air-inlet chamber is a convenient place, and the lower the point in the line of the main house-drain at which this juncture is made, the better. Sewers are always laid deep enough for the drainage of the basement floors of houses. They are, therefore, deeper than is required for the outlet of a house-drain, which is laid for the drainage of the rain-water of the back premises and that of the sculleries and ground-floor offices, even though they be a long way from the street. It is, therefore, not necessary to lay the whole length of the house-drain as deep as it might be laid; but in order to get well under the level of the ground-water, the house-drain between the sewer and the intercepting trap should be laid for that distance as deep as the sewer-junction will allow, if that depth be not more than, say, 9 or 10 feet. From the intercepting trap upwards, the depth of the house-drain is governed by that of the lowest floor upon which water is used for any purpose, and if this be the ground-floor, the drain need not be more than 5 or 6 ft. deep on the upper side of the air-inlet adjoining the intercepting trap. We have, therefore, in some situations a brick shaft, the bottom of which may be 8 or 9 ft. below the surface, at which level the sewage leaves it, but enters it at a level several feet higher.

The addition to the sewage of even the comparatively small amount of water derived from the ground beneath and around houses is unwelcome at the outfall in cases where the sewage is pumped to any considerable height, or even in those cases where it flows away by gravitation, if the quantity of sewage be much increased thereby; but inasmuch as it contributes to the proper sanitary condition of the sites of houses, it should be effected even at some inconvenience in dealing with an increased quantity of sewage. The case is different to that of dealing with an excessive quantity of rain-water from the surface at uncertain times: the addition of ground-water to the sewage is a more regular addition, and although its quantity cannot be very closely calculated beforehand, a tolerably near approximation to it may be found on the basis of information to be obtained from well-sinkers, and otherwise, and from the area of those parts of a town which are situated upon ground from which water may be thus derived. Water following special courses through the ground, as it does in some situations, if met with by cutting through these courses in laying a drain or a sewer, must be dealt with by special means, or excluded altogether, which, however, is a difficult thing to do when once interfered with; but none of these considerations should prevent the opportunity being taken of drying the sites of houses by means of the outlets afforded by the house-drains in ordinary cases. It does not follow from this that sewers should likewise be made to admit ground-water, inasmuch as they are laid at greater depths. It would be equally desirable, but it might involve an expense at the outfall which would be undesirable to such an extent as to make it prohibitory; but for house-drains the rule should apply in all cases, with the exceptions named only. Land-drain pipes without sockets are sufficient for the purpose, and the trench should be filled in over them with hard material, such as gravel, for the purpose of providing interstices through which the water may first find its way to the drain. The width of the trench is of no importance, and may be as narrow as will admit of the pipes being laid in, requiring, therefore, no great quantity of hard material, which sometimes has to be brought from a distance. If the bottom of the air-inlet shaft or chamber be laid deep enough for the admission of this ground-water drain, it can have no better outlet; the trap which prevents the air of the sewer passing up the drain also prevents it passing up the ground-water drain, and it therefore needs no other trap. If, however, the intercepting trap cannot for any reason be relied upon, then it is better to place a trap also at the end of the ground-water drain, for to admit foul air into it would be to contaminate all the air in the ground under and immediately around the house. When a trap is so placed in the ground-water drain there should be an air inlet on its upper side, for which a 6-in. pipe is sufficient. When the main drain above the intercepting trap is laid deep enough for the drainage of a basement or cellar floor, it will also be deep enough at any part for the junction of the ground-water drain; but it should not enter the house-drain at the same level, for, if the quantity of ground-water be at all considerable, it would in that case interfere with the proper flow of the sewage. The bottom of the ground-water drain should be 3 in. higher than the bottom of the house-drain. For this reason the junction should be made at the air-inlet shaft or chamber, where the side wall offers every facility for admitting the branch at a higher level than that of the main drain.

Books.

The Telephone. By WILLIAM HENRY PREECE, F.R.S., and JULIUS MAIER, Ph.D. London: Whittaker & Co. 1889. Price 12s. 6d.

IN July, 1877, Mr. W. H. Preece brought the first pair of practical telephones to Europe. There are now 200,000 in daily use. In the short space of eleven years there has grown up all over the world not only a great but a highly specialised industry. Unlike the steam-engine, the railway, and the telegraph, the telephone sprang into full vigour and public use immediately on its invention; and if we in England make less use of it than is made in other countries, this is largely due to the "terrible monopoly," as Messrs. Preece & Maier call it, of the holders of the English patent rights. The problem to be solved was understood years before the telephone was invented. It was, in Sir William Thomson's words, to devise means "to realise the mathematical conception that, if electricity is to convey all the delicacies of quality which distinguish articulate speech, the strength of its currents must vary continuously, as nearly as may be, in simple proportion to the velocity of a particle of air engaged in constituting the sound." The problem appears to have been clearly in the mind of Mr. Charles Bourseul, who in 1854 published a paper on the electric transmission of speech; but the first man to solve the problem in anything like a practical way was Philipp Reis, of Friedrichsdorf, in 1860. Reis's telephone was intended in the first instance to convey only musical sounds; but Messrs. Preece and Maier are of opinion that it "certainly did transmit speech." On this point there has been much controversy. However this may be, certain it is that for the next sixteen years nothing was done in connexion with the speaking telephone, though many improvements were made on the musical telephone by many inventors. At the beginning

of 1876 the speaking telephone was invented by Mr. Graham Bell, a native of Edinburgh, but a naturalised citizen of the United States. Strange to say, on the very day on which Bell applied for his American patent, application was made for a patent for a similar instrument by Mr. Elisha Gray, who had experimented largely on musical telephones. Gray failed, apparently, to see the commercial value of his invention, for he did nothing to develop it. Bell's instrument, in a somewhat modified form, was exhibited at the Philadelphia Exhibition in 1876, and, in the form in which we now know it, was exhibited for the first time at Salem, Mass., on the 12th February, 1877, when a speech was conveyed by it from Boston, sixteen miles off. As it was invented then it remains now—unsurpassed for real simplicity, efficiency, and economy, as may be gathered from the fact that 99 per cent. of the receivers at present in use are pure Bell telephones. But Bell's telephone, as might be known from theoretical considerations, does not make a good transmitter. Edison, in 1878, attempted to utilise the fact, announced long before by Du Moncel, that the resistance of carbon varied under pressure, and produced his carbon transmitter; but his instrument was by no means satisfactory. Hughes's invention of the microphone, depending on the variation of resistance in a loose contact, first showed the way to a really efficient transmitter; and now "in the same way as all magnetic telephones are more or less imitations or modifications of the original Bell instrument, so all carbon transmitters are now modifications of Hughes's ingenious apparatus." The directors of the "Specialists' Series," of which "The Telephone" is the latest volume, have done well in selecting as authors Messrs. Preece and Maier, both of whom hold positions which give them every opportunity of making themselves acquainted with every branch of their subject in all its developments. The book is the most comprehensive and best English book on the subject,—so good that we cannot help regretting that its few defects exist. It begins with a very short and somewhat bare historical "Introduction." Then follow two chapters on "Sound and Speech" and "Induction," of which we can only say that, if they were required at all, they should have been much more full. As they stand they are too compressed to be of use to any person who requires information on the subjects of which they treat. The fifth chapter, on the theory of the telephone and the microphone, is open to the same criticism. The rest of the book deserves nothing but praise. The third and fourth chapters describe the Bell telephone, the Edison carbon transmitter, and Hughes's microphone. Next follow descriptions of the most interesting forms of receivers: The Gower; Ader's, extensively used in France, Belgium, and Austria; Kotyra's; D'Arsonval's; Siemens'; Newmanger's, used in the Bavarian telephone service; Goloubitzky's, an attempt to obtain more intense sound by combining several telephones into one; Böttcher's; and lastly, the Bell receiver of the Swiss Telephone Administration. Carbon transmitters follow: the Gower-Bell, the Blake, the Hunning's, "certainly the most powerful instrument tried in England," crushed for the present by the United Telephone Company's monopoly, and many others. Strangely enough, among the many forms of instruments described, no place is found for two well known and in actual use in England: those of Mr. Swinton and Mr. Silvanus Thompson. Chapter IX. is one of the most valuable in the book. In it are given the results of experiments on various transmitters and induction coils, and the law which determines the distance to which speaking by telephone on land lines is possible. This distance is not a mere question of length. It depends "on the resistance of the wire, on its inductive capacity, and also on its electromagnetic inertia"; and data are given from which these may be determined. The rest of the book is taken up with descriptions of the technical working details of telephone systems both in England and abroad—descriptions that could have been written only by persons thoroughly conversant not only with the principles but also with the practice. First in importance is the question of wire, iron or copper; and Messrs. Preece and Maier have no hesitation in deciding in favour of copper. Details are given of the various modes of laying wires, of the different kinds of cables, call-bells, switches, lightning protectors, the arrangements at terminal and intermediate stations, telephone exchanges, (English post-office, French, German, Swiss, &c.), with descriptions of the switch-boards and other appliances used, and many particulars of the various systems of administration. Here it is interesting to note that the annual charge for subscribers in Switzerland is £6, as against £20 charged by the United Telephone Company in London, and £12 charged by the Lancashire and Cheshire Company. A chapter on the use of the telephone in military operations, and another on its miscellaneous applications to medical science, &c., bring the book to an end. Ducretet's stethoscope, Boudet's microphone, which serves the purpose of a sphygmograph, a myophone, &c.; Hughes's induction balance, used for finding bullets, as in the case of President Garfield; McEvoy's modification of the induction balance, used for finding torpedoes, lost cables, anchors, &c., these and other instruments, though only touched upon, serve to show the wide field,—doubtless soon to become much wider,—laid open by Mr. Graham Bell's invention of an instrument for the "electrical transmission of harmonic vibrations."

Transmission of Power by Fluid Pressure, Air, and Water. By WILLIAM DONALDSON, M.A., M. Inst. C.E. (London: E. & F. N. Spon.)

TRANSMISSION of power is becoming almost as important a subject as the production of power. This is a tendency of the increased demands for mechanical power in all departments of manufacturing industry. For years engineers were content with the leather belt or wheel-gearing for transmitting power, and these appliances practically confined the motor to the vicinity of its work. Then Lord Armstrong popularised hydraulic power, and an immense step was made. Later, the improvements in steel wire rope put another alternative within reach of the engineer; whilst later still, electricity and compressed air have come to the fore. Mr. Donaldson's book treats of air and water, and, as might be expected from the course his inventive bent has followed, he gives a decided preference for the heavier and non-elastic element. He points out what he designates the four fallacies into which most advocates of compressed air for transmission of power have fallen, viz.:—1. That there is no appreciable loss of energy due to pipe-friction. 2. That the energy lost by cooling can be restored by reheating, without entailing a still heavier loss. 3. That, owing to the shock caused by the sudden changes in velocity in a heavy fluid like water, only small velocities are permissible. 4. That greater power can be transmitted by air compressed up to 45 lb. pressure than by water up to 800 lb. Those who have the mathematical ability to follow the author in a discussion of these knotty problems may find a rare academical treat in the pages put before them. Mr. Donaldson is well known as an accomplished mathematician, and, from a mathematical point of view, his opinions must be received with every consideration. It would be well to remember, however, that the proverbial "slip 'twixt cup and lip" seldom is more apparent than in passing from the theories of the mathematician to the practice of the engineer.

The Mechanic's Workshop Handybook; a Practical Manual on Mechanical Manipulation. By Paul N. HASLUCK. (London: Crosby Lockwood & Son.)

THIS is one of that numerous class of books which cannot be said to be specially wanted, and yet, probably, it will usefully fill a place in the working library of a good many mechanics. We will quote the headings of the nine chapters into which it is divided, in order to give an idea of its scope:—"Metals and Alloys," "Iron and its Treatment," "Steel and its Treatment," "Brass and its Treatment," "Solders and Soldering," "Files and Filing," "Tool Grinding," "Drills and Drilling," "Abrasive and Finishing Processes." Probably there is not much information under these headings that the practised workman will acquire for the first time, unless it be some terms not in ordinary use, amongst which we would instance "diameter-wise." "Mechanician," too, is a poor substitute for "Mechanic." The beginner and amateur will, however, no doubt discover a good many useful hints. In treating of case-hardening, in the second chapter, the author omits to state that objects are frequently distorted in the process, a fact the amateur is likely to find out to his cost. The author does well to refer to the difference between "hardening" and "tempering"; terms which the practical workers in steel too often use without proper discrimination. We miss phosphor-bronze, manganese-bronze, and delta-metal in the chapter on brasses,—an omission which would seem to indicate that the author had not brought his researches in this direction up to recent date. There is a useful chapter on solders, and a good many instructions on filing, which should be of advantage to the amateur who has not the benefit of example to help him in acquiring this somewhat difficult art. The same may be said of the chapter on tool-grinding. There is also a good chapter on drills, in which the advantages of the twist-drill are rightly insisted upon. The author well points out the necessity of machine-grinding. In many a shop twist-drills have been pronounced bad, because those who introduced them would not go to the expense of a machine-grinder; and twist-drills cannot, as a matter of shop practice, be accurately ground by hand, in spite of the grinding-line. The managers of more than one machine-shop in this country might read Mr. Hasluck's remarks on this subject with advantage. There are yet some large engineering works where twist-drills are ground by hand, and, as a natural consequence, very few are used. Mr. Hasluck refers to the non-cutting nose of the flat drill, and it may be remarked that the same defect exists ordinarily in the twist-drill. An ingenious little instrument has, however, been devised by which the nose can be brought to a point without weakening the drill to any appreciable extent.

The Clyde, from its Source to the Sea. By W. I. MILLAR, C.E. London, Glasgow, Edinburgh, and Dublin: Blackie & Son. 1888.

THE beauties of the Clyde were sung by Wilson, the unfortunate,—or fortunate,—Lanark poet, who was appointed to the Grammar School of Greenock in 1767, on condition that he would give up "the profane and *unprofitable* art of poem making." The present encomiast delivers himself in prose, and in that vehicle has conveyed perhaps more forcibly than poor Wilson did in verse the many beauties and vast utilities connected with the famous river.

He touches in turn upon every subject which can interest curious humanity,—the topography of the river, and the geology of the district through which it cuts its seaward way; the historical, archæological, architectural, or social interest connected therewith, and the opportunities afforded to the sportsman, the sketcher, and the idler.

The Clyde was the first European river upon which the steamboat was used commercially, and the Clyde ship-building trade and its allied industries take up a large share of the book, which includes an interesting series of diagrams showing the gradual growth in the size of steam-vessels, from the *Comet* of 1812 to the *Great Eastern* of 1857.

Other topics of local interest,—such as the great scheme for supplying the town of Glasgow with water from Loch Katrine,—are fully dealt with, and the book is throughout pleasantly written and charmingly illustrated, some of the sketches,—notably "Rough Weather on the Clyde,"—being as good as they can be.

It is unencumbered by advertising sheets, which is a virtue; but it is without an index, which is a blemish; and the author might have found space in his account of the new Municipal Buildings at Glasgow for at least the architect's name.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

1,873, Raising and Retaining Window-sashes. J. Simpson.

According to this invention, movable pulleys are affixed to the frame or sash, under which is passed a cord or belt, one end being secured to the permanent framework, and the remaining one carried over other rollers to a position convenient for moving by hand. The leverage of the movable pulleys being in the ratio of two to one, the power requisite to lift the sash is reduced one-half. To retain the sash an eccentric roller is introduced, which is moved to or from the sash by a lever acted upon by the tension of the cord or belt, or by hand. In order to keep steady the upper part of the sash a ball or roller, resting loosely on an inclined surface of the permanent part, is arranged. By pressure against the sash this holds it firm.

3,229, Valve W.C.'s. W. D. Scott-Moncrieff.

In order that the handle may be moved easily, and the tumbler or quadrant of the outlet valve may

work more smoothly and effectively, the weighted lever is, by this invention, provided with supplementary connexions, which communicate a parallel vertical movement to the handle, and a spiral spring is also affixed to assist the movement.

4,773, Fixing Tiles. W. J. White.

To prevent the tiles from coming off, or being detached from the partition or ceiling, lugs are, by this invention, cast upon them, the lugs being flush with the back, and less than the thickness of the tile. On the back of each tile are indentations or recesses to receive the lugs, and the whole affords a secure bond or fastening.

5,111, Set Squares, Protractors, &c. T. H. Barrodale.

According to this invention, set squares, rules, or protractors, are marked in straight or curved lines in such a way that the measurement and construction of the angles may be set off from the edge of the rule or protractor. The zero point of the scale of linear measurement is coincident with the angular point or vertex of the angles measured. The scale of linear measurement and the scale of angular measurement extends either to both right and left, or to either side only, of the zero point.

13,526, Convertible Window-sashes. John Twitchin.

By this invention hinges are fitted and recessed into the stile and rail of the sash so as to lie flush when the sash is in its ordinary sliding position. One of the flaps of each hinge is securely screwed to the sash, the upper hinge being of an L form to strengthen the connection between the stile and the upper bar. The adjoining flaps of the hinges are formed to receive a single screw for temporarily sustaining the sash. The lower hinge is provided with a prong which enters a staple fixed to the frame. An iron strap is fitted which has a screw passed through it. The lower parts of the inner and parting beads are removed, the screws are then inserted in the hinges and in the strap. The sash can then be opened inwards sustained by the hinges.

18,330, Union Joint for Pipes. G. Goffin.

This invention relates to connecting lead-pipes, and facilitates the making connection between such metallic pipes, the joint being made without soldering any part or parts of either the union or the pipe. One end of the pipe is slipped over the other, and is worked into a flange, and then the union is screwed home. Where the metal is hard enough a thread is tapped upon it, and the pipes are brought into contact one with the other, thus ensuring a perfect joint.

5-1889, Flooring-cramp. W. Andrew.

A cheap, simple, and convenient form of flooring-cramp is made by a compact arrangement of levers, pawls, and ratchets, which are so formed and placed as to be quickly operated, and so made as to effect a saving in cost of manufacture while affording the maximum of strength.

NEW APPLICATIONS FOR PATENTS.

Feb. 18.—2,817, W. Laycock, Facilitating the Opening, Closing, and Securing Windows, &c.—2,827, W. Williams, Wood Paving.—2,844, A. Ponton and others, Artificial Stone.—2,857, W. Meister, Planes.—2,862, W. Lake, Water-closets, &c.

Feb. 19.—2,882, J. Millar, Combined Bath and Lavatory.—2,883, T. Harries and J. Dougall, Machine for Grinding and Polishing Marble, Granite, Slate, &c.—2,884, W. Perrott, Sash Fastener.—2,890, G. Robinson and H. James, Window Fasteners.—2,919, C. Gilman, Fireproofing Ceilings.—2,920, C. Gilman, Construction of Roofs.—2,921, C. Gilmaz, Fireproof Floors and Roofs.—2,922, C. Gilman, Fireproofing Wood or Iron Posts or Columns for Buildings.—2,923, C. Gilman, Fireproof Floors and Ceilings.—2,924, C. Gilman, Outer Walls of Buildings.—2,925, C. Gilman, Roofs or Coverings for Buildings.—2,826, C. Gilman, Pavements or Side-walks.—2,946. H. Lake, Brick and Tile-making Machines.—2,962, P. and E. Brannen, Combinations of Concreted and Plastering Materials in Application to Fireproofing.

Feb. 20. — 2,993, J. Matthieson and others, Stoves, &c.—3,017, F. Baker and I. Cohen, Cupboard and Door Fastenings.—3,057, J. Evans, Fasteners for Window-sashes, &c.

Feb. 21.—3,063, J. Thompson and J. Kirby, Cup-and-Ball Gas Joints.—3,076, W. Cowan, Syphon Flushing Cisterns.—3,088, W. Asaiter, Joints of Stoneware Pipes, Traps, &c.—3,117, H. Abbott, Securing Window-sashes, Casements, &c., in open and closed positions.—3,143, W. Jones Branding Timber.—3,144, G. A. and R. Bell, Bricks.

Feb. 22.—3,155, J. Kidd, Sash-fastener.—3,173, J. Sharples, Pans of Water-closets.—3,190, G. Dickson and W. Brodie, Water-closets and Traps.

Feb. 23.—3,234, T. Dykes, Sash-fastener.—3,231, T. Day, Window-fastener.—3,254, E. Showell, Indicating Bolts or Fasteners.—3,265, J. and W. Cotterill, Fire-grates.—3,281, J. Swallow and J. Jackson, Manufacture of Bricks, Tiles, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

11,427, J. Millar, Underground Buildings for Sanitary Purposes.—17,062, T. Birnbaum, Moulding and Fillets for Joinery, &c.—17,990, W. Balmforth, Securing Door-knobs to Spindles.—18,352, J. Williamson, Fasteners for Shakey Windows.—18,884, J. Wilkinson, Window Fastener.—18,866, J. Twyford, Lavatory, &c., Basins and Fittings.—18,944, E. Johns, Lavatory Basins, &c.—403, E. Pignot and F. Durand, Cowl or Chimney-top.—463, M. Syer, Ball Valve.—862, W. Stephenson, Door Closers and Checks.—1,045, W. and A. McVitie.—1,240, E. Cory and others, Motive-power Mortising-machines.—1,263, W. Lorenz, Straight and Circular Saws, &c.—1,282, J. Hannay, Whitelead, &c.—1,300, O. Christie and F. Mason, Draught and Dust Preventer for Doors.—1,346, J. Hall, White-lead.—1,403, J. Clarke, Revolving Window-Frames.—1,532, J. Franks, Fire-places.—1,580, T. Hill, Sash-fastener.—1,613, A. Stevenson, Window Ventilation.—1,630, E. Wasdell, Syphon-Flushing Cisterns.—1,684, G. Binks, Opening, Closing, and Fastening Fanlights, &c.—1,818, C. Stone, Chimney-cowls.—1,863, C. Hall, Sliding Flush-bolt.—1,941, W. Longley, Fire-resisting Door, &c.—2,167, H. Waggett, Nails.—2 171, E. Lund, Book-cases.—2,237, C. Smith, Window-fasteners, &c.—2,254, W. Pearse, Window-catch.—2,257, A. Bostock, Window-sash Fasteners.—2,353, J. Edwards, Sash-fasteners.—2,468, J. Evans, Fasteners for Window-sashes, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

4,003, E. Verity and others, Attaching the Knobs of Locks to Spindles.—4,526, J. Mann and others, Pneumatic Apparatus for Dressing Stone, &c.—4,782, W. Booth, Window-sash Fasteners, &c.—5,229, S. Eddington and J. Stevenson, Brick Moulding-machines.—9,319, W. Thompson, Carving-Machines.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

FEB. 25.

By BAXTER, PAYNE, & LEPPER.

Beckenham—The residence called "Chesterleigh," 77 years, ground-rent £17	£1,400
Edgware — Freehold cottage, outbuildings, and 1a. 0r. 28p.	715

By FULLER, MOON, & FULLER.

Wandsworth-road—Nos. 234 and 236, term 20 years, ground-rent £10	800

FEB. 26.

By WESTON & SON.

Stepney—62 and 64, Ben Jonson-road, 34 years, ground-rent £6	400
66, Ben Jonson-road, and 21, Taylor's-place, 34 years, ground-rent £6	570
1, Taylor's-place, 34 years, ground-rent £2	100
68 to 74 (even), Ben Jonson-road, 34 years, ground-rent £12	640
Clapham—96, Manor-street, 26 years, ground-rent £5	280
Stockwell—34, Burgoyne-road, 78 years, ground-rent £5	235

By F. J. BURLEY.

Bermondsey—1 to 7, Willow-street, 33 years, ground-rent £14	1,105
8 to 11, Willow-street, 33 years, ground-rent £8	615

By DEBENHAM, TEWSON, & Co.

London Docks—24, 26, and 28, Dock-street, freehold	830
22, Dock-street, "The Sir Sidney Smith" public-house, freehold	2,000
Tottenham—1 and 2, Everitt-villas, freehold	300
Bethnal Green—18 to 36, Chambord-street, 23 years, ground-rent £180	200

By W. A. BLAKEMORE.

South Kensington—43, Redcliffe-road, 72 years, ground-rent £10	830
Wandsworth-road—11 to 14, Albion-road, 35 years, ground-rent £24	1,015
Wandsworth—30 to 50 even, Worple-way, 64 years, ground-rent £19	785
49 to 53, Bridgefield-grove, 64 years, ground-rent £13	310

FEB. 27.

By W. HIXON.

Bermondsey—206 and 208, Southwark Park-road, 37 years, ground-rent £13. 2s.	540
225 and 227, Fort-road, 45 years, ground-rent £8	700

By G. A. WILKINSON.

Fulham—Nos. 87a and 87b, High-street, freehold	1,900

By SHERRIN & COLTMAN.

Long-acre—No. 11, freehold	750
Kentish Town—1, Raglan-cottages, 85 years, ground-rent £4	210
5 and 6, Alma-street, 35 years, ground-rent £10	440

By F. JOLLY & Co.

Mile End—155 and 157, Ernest-street, 75 years, ground-rent £4	330
Plaistow—9, Stock-street, 77 years, ground-rent £4	150
2, Guildford-terrace, 75 years, ground-rent £3. 18s.	250
Canning Town—178, Barking-road, and goodwill, &c., term 18 years	100
West Ham, The Portway—"Jubee Cottage," freehold	550

FEB. 28.

By E. & F. SWAIN.

Notting-hill—89, Elgin-crescent, 63 years, ground-rent £15	510

By RUSHWORTH & STEVENS.

St. John's Wood—27 and 29, Carlton-hill, 44½ years, ground-rent £31	1,220

By C. C. & T. MOORE.

Victoria Park—101, Approach-road, 65 years, ground-rent £6. 5s.	330

By R. STIMSON.

Norwood, College-road—The residence, "Woodstowe," 66 years, ground-rent £32. 6s.	1,550
The freehold residences, "Genesta" and "Magville"	1,800
West Norwood—55, 57, and 59, Chatsworth-road, 99 years, ground-rent £37	1,650
Brixton—7, Poplar-walk, 78 years, ground-rent £4. 10s.	190
35 and 37, Poplar-walk, 78 years, ground-rent £9	375
94, Lowden-road, 78 years, ground-rent £5	170

By NEWSON & HARDING.

Barnsbury — 16, Pulteney-terrace, 15 years, ground-rent £3. 10s.	110
Euston-road — 2 and 3, Drummond-crescent, 12 years, ground-rent £21	200
West Hampstead—63, Finchley New-road, 49 years, ground-rent £24	1,000
Hoxton—9 to 12, Hutley-place, 30 years, ground-rent £10	255
Barnsbury — 111, Copenhagen-street, 32 years, ground-rent £6. 6s.	350

By ELLIOTT, SON, & BOTTON.

Portland Estate—40, Wigmore-street; and 3, Little Welbeck-street, the lease of, term 25 years	6,000
32, Queen Anne-street, 7½ years, ground-rent £25	620
East Finchley, Willow-walk—Six freehold cottages	420

By JENKINS, SONS, & ELLIS.

Brockley—103, Manor-road, 79 years, ground-rent £10	1,000
Deptford — 1, Adolphus-street, 83 years, ground-rent £4. 15s.	275
Rotherhithe—5, Suffolk-street, 61 years, ground-rent £3. 6s. 8d.	165
Camberwell—6 to 9, Champion-terrace, 70 years, ground-rent £16	790

MARCH 1.

By MURRELL & SCORELL.

Aldermanbury, E.C.—Ground-rent of £130, reversion in 37 years	4,340

By VENTON, BULL, & COOPER.

Bromley, Kent—Two plots of freehold land	90

By R. HOLSWORTH.

Haggerston—9, Nelson-terrace, 51 years, ground-rent £4	365
Camden Town—144 and 146, Arlington-road, 12½ years, ground-rent £4. 4s.	225
Dalston—94, Landsdowne-road, 57 years, ground-rent £5	360
Stoke Newington—47, Manry-road, 86 years, ground-rent £7	400
72, Evering-road, 67 years, ground-rent £9	335

MEETINGS.

SATURDAY, MARCH 9.

South Kensington Museum. Mr. J. Starkie Gardner on "Iron and Artistic Ironwork." II. 3 p.m.

Royal Institution.—The Rt. Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." III. 3 p.m.

MONDAY, MARCH 11.

Royal Institute of British Architects.—Special General Meeting of Members only to Elect the Royal Gold Medallist, followed by a Business Meeting of Members only. 8 p.m.

Royal Academy (Lectures in Sculpture).—Professor J. H. Middleton on "The Development of Mediæval Sculpture in Tuscany, as Compared with that in other Parts of Italy." III. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Walter Crane on "The Decoration and Illustration of Books." II. 8 p.m.

TUESDAY, MARCH 12.

Institution of Civil Engineers.—Mr. F. J. Waring on "Indian Railways: the Broad and the Metre Gauge Systems Contrasted." 8 p.m.

Sanitary Institute (Lectures for Sanitary Inspectors).—Dr. Louis Parkes on "Water Supply, Drinking Water, Pollution of Water." 8 p.m.

Birmingham Architectural Association.—A Paper will be read by Mr. W. Henman.

WEDNESDAY, MARCH 13.

Architects' Benevolent Society.—Annual General Meeting. 5 p.m.

Carpenters' Hall (London Wall).—Mr. Thomas Blashill on "English and Continental Doors." 8 p.m.

Society of Arts.—Mr. W. Anderson on "Aluminium and its Manufacture by the Deville-Castner Process." 8 p.m.

Inventors' Institute.—8 p.m.

THURSDAY, MARCH 14.

Institution of Electrical Engineers.—Discussion on Professor G. Forbes' paper on "Some Electric Lighting Central Stations in Europe, and their Lessons." 8 p.m.

Society for the Encouragement of the Fine Arts.—Mr. Ralph Nevill, F.S.A., on "Tradition or Originality in Architecture?" 8 p.m.

Society of Antiquaries.—8.30 p.m.

Sanitary Institute.—Professor G. R. Milne Murray on "Fungi in their Relation to Putrefaction and Sanitation." 5 p.m.

FRIDAY, MARCH 15.

Architectural Association.—Mr. A. Beresford Pite on "Wall Papers: their Design and Manufacture." 7.30 p.m.

Royal Institution.—Sir James N. Douglass, F.R.S., on "Beacon Lights and Fog Signals." 9 p.m.

Sanitary Institute (Lecture for Sanitary Inspectors).—Sir Douglas Galton, F.R.S., on "Ventilation, Measurement of Cubic Space, &c." 8 p.m.

SATURDAY, MARCH 16.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." IV. 3 p.m.

Glasgow Architectural Association.—Visit to Cook' Memorial Baptist Church, Paisley.

Miscellanea.

The Construction of Roads.—At a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening last, Mr. Jonathan R. Baillie, President, in the chair, a paper was read on "The Construction and Repair of Roads," by Mr. George R. Strachan, Assoc. M. Inst. C.E., of Chelsea. The author said that the true principle of road construction was to make the foundation the real road, and the material thereon a wearing surface only. Its use secured economy in construction and maintenance. Roads should be made to suit the vehicles using them, and not the vehicles to suit the road. A concrete foundation 6 in. thick would carry 600 tons per yard per day without deterioration. It should be constructed carefully, accurately, and scientifically, for it was the actual road. Asphalte, as a wearing surface, was the best in use to-day, as it possessed the advantages of durability, cleanliness, economy, and healthiness, which outweighed its slipperiness. When laid 2½ in. thick it gives a life of fifteen years in Cheapside, at a cost of 13s. per square yard. The first cost of such a road 36 ft. wide equalled 12,788*l.* per mile, and the average annual cost for repairs equalled 528*l.* per mile. The asphalte could be renewed at half the original cost, and a life of fifteen years was again before it. Wood was a useful wearing surface. Swedish yellow deal had given ten years of life under a traffic of 600 tons per yard per day, and the wear had not exceeded 3 in. The cost was 9s. 6d. per square yard, not taking credit for old material, and the annual cost of repairs 3d. per square yard. The first cost of such a road 36 ft. wide equalled 9,932*l.* per mile, and the annual average cost for repairs equalled 264*l.* per mile. Soft woods were preferable to hard woods. The creosoting of blocks added to their life, and was advisable for severe traffic. Wood was not suitable for light traffic. Stone pavements were practically prohibited by the noise they made. A 3 in. by 7 in. Guernsey granite paved road on concrete cost 15s. per square yard, and gave fifteen years' life. The first cost of such a road 36 ft. wide would be 15,840*l.* a mile, and the annual repairs 88*l.* per mile.

The English Iron Trade.—The English iron market continues buoyant, the steady rise in pig-iron and a well-sustained demand for finished products also sending up the prices of manufactured iron and steel. The favourable nature of the Cleveland ironmasters' returns for February, and the activity of the home demand, have led to a second rise of 9d. a ton (making from 1s. 6d. to 2s. in the fortnight) in No. 3 G.M.B., which is now quoted 36s. 9d., and may even, it is said, before long go up to 40s. The Glasgow warrant market has again been strong this week, and is still in a rising tendency. Scotch pig-iron makers have also raised their quotations, the advances ranging from 6d. to 1s. a ton. Lancashire producers of crude iron are 1s. higher in their prices; while Lincolnshire, Derbyshire, and Staffordshire makers are also quoting advanced figures. Bessemer iron in the north-west is 6d. better in price. The higher rates that have to be paid for pig-iron have caused manufacturers of finished iron in the North of England to quote their products 2s. 6d. a ton higher; Scotch makers have put up marked bars 5s.; while in the other districts manufacturers are very firm, and will probably soon follow the lead of the Cleveland and Scotch ironmasters. There being an improvement in the demands for tinplates, quotations are firmer than they have been recently. Enhanced prices are current for steel, rails being quoted up to £4. 7s. 6d. and £4. 10s., and advances have been declared in shipbuilding steel. Some further orders for new ships have been fixed during the week, and others are in the market, but builders are not very ready to take fresh work on account of the uncertainty as to the prices of shipbuilding material. Engineers continue to be very fully booked with orders.—*Iron.*

The Competition for the new Parliamentary Buildings in Stockholm.—The competition for the new Parliamentary buildings, to be erected in Stockholm promises to be a keen one, no fewer than one hundred architects having entered for it.

Ancient Sculpture in Bronze.—We are again obliged to hold over the reports of Mr. A. S. Murray's lectures on this subject at the Royal Academy.

Technical Education: The Blacksmiths' Company.—The great interest felt in promoting what is universally admitted to be a necessity of the times, viz., "Technical Education," has caused several of the City Companies to initiate and hold from time to time exhibitions of work of the craft with which they are associated. The blacksmiths' craft is admittedly a very useful branch of the manufacturing industry of the country, and has in recent years once again taken up ornamental work, embracing panel-work for building decoration, as well as articles for house and table decoration. The fact that a large quantity of such work is being imported into this country is an evidence that there is a market for it, and has caused the Blacksmiths' Company (one of the oldest of the City guilds) to determine to hold an exhibition of the description of work alluded to, and to offer inducements, by way of money prizes, certificates of merit, medals, and in certain cases the honorary freedom of the Company, to journeymen and apprentices of the trade to send in articles for competition. The Company purpose holding, towards the end of March, an exhibition of the work sent in. The Court of the Ironmongers' Company having been approached, have kindly determined to grant the use of their hall for the purposes of the exhibition. The Company having come forward to initiate the good work, the journeymen and apprentices connected with the trade must evidence to the world that they are both ready and willing to do all in their power to make the exhibition in which they, at any rate, have so great an interest, in every way a success. The Clerk to the Company, Mr. William B. Garrett, of 16, Water-lane, Great Tower-street, will be glad to furnish every information required by persons proposing to exhibit or taking an interest in the good work in hand.—*City Press.*

Birmingham Architectural Association.—At the meeting of this Association held on Tuesday evening last, a paper on "The Modern Architecture of Vienna," by Mr. T. Blashill, Superintending Architect of the Metropolitan Board of Works, was read in his unavoidable absence by Mr. H. R. Lloyd (hon. sec.). Mr. Blashill said that the climate was characterised by brightness, and that in the centre of the city houses of some architectural pretension were inhabited in flats by the middle classes and artisans, the latter being closely packed, and both paying much more for less accommodation than their equals in London; and he passed on to describe some of the chief buildings in Vienna, among them the Hof Theatre, designed by Baron von Hasenauer, sumptuous in design and decoration; Ferstel's University and Votive Church, the latter one of the rare examples of modern Gothic; the Palace of Justice and the Town Hall designed by Baron Von Schmidt; the two Imperial Museums, and the new Palace now being built for the Emperor, and the only instance known to Mr. Blashill of a successful use of a pure Greek style in a complicated building. Mr. Blashill said that a marked feature of Viennese buildings is the free use of sculpture, and that many very successful buildings are built of brick and stucco, and concluded his paper by remarking upon the grand combination of tact, talent, and business capacity which had produced the improvements in the city, and made it so well worthy of study. The paper was illustrated by a large collection of fine photographs.

A New Window at Edinburgh.—The Jubilee year has been commemorated by the Society of Writers to the Signet in Edinburgh by the filling-in of the west window of their hall in Parliament-square with stained glass. The window is square-headed, about 20 ft. in height, and is divided into three lights, a wide central one, and two narrow ones separated by heavy mullions. In the middle of the central compartment appears the Royal Arms of Scotland, having the sword and sceptre crossed behind it and the crown above. Over the Royal Arms appears that of the Society, and in the lower section are placed the arms of the Earl of Glasgow, the present Keeper of the Signet, and of the late Mr. John Clerk Brodie, who was his deputy. In the side-lights appear the arms of former Keepers and Deputy-keepers of the Signet. The borders of the three lights and the devices in general are Renaissance in style, and the details are rich and brilliant in colour, harmonised by a silvery background. On a scroll at the foot is recorded the occasion of the erection of the window, which has been executed by Messrs. Ballantyne & Sons.

The Seville Cathedral.—Some months ago, it may be remembered, part of the roof of the chancel in the Seville Cathedral fell in, owing to two pillars supporting it giving way. However, by dint of considerable exertion, and at great cost, with no small danger to the workmen, any further falling in of this venerable edifice was believed to have been averted; but this appears, according to Madrid journals, not to be the case, the work of restoration having some days ago to be suspended owing to a third pier and a further portion of the roof threatening to collapse, and the architect directing the work, Señor Casanova, has declared that if the building is to be saved at all it will be necessary to support it by shoring all round and re-erecting the piers from the base. However, as the money required for this work will hardly be forthcoming, the Madrid press appears to consider the old Andalusian cathedral doomed.

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Teak, E.I. ..... load	9 0 0	14 0 0
Sequoia, U.S. ..... foot cube	0 2 3	0 3 0
Ash, Canada ..... load	3 10 0	5 0 0
Birch ,, ...	3 10 0	6 0 0
Elm ,, ...	4 0 0	5 0 0
Fir, Dantsic, &c.	3 0 0	4 0 0
Oak ,, ...	3 10 0	4 10 0
Canada	5 10 0	7 10 0
Pine, Canada red	3 5 0	4 0 0
,, yellow	3 10 0	5 10 0
Lath, Dantsic ..... fathom	4 10 0	5 10 0
St. Petersburg	5 0 0	6 10 0
Wainscot, Riga, &c. ..... log	3 15 0	4 5 0
,, Odessa, crown	2 15 0	3 5 0
Deals, Finland, 2nd and 1st ...std. 100	9 10 0	10 10 0
,, ,, 4th and 3rd	7 10 0	9 0 0
Riga	7 10 0	8 10 0
St. Petersburg, 1st yellow	11 10 0	15 0 0
,, 2nd ,, ...	9 10 0	11 0 0
,, white	8 10 0	10 10 0
Swedish	8 10 0	16 0 0
White Sea	9 10 0	17 0 0
Canada, Pine, 1st	16 0 0	38 10 0
,, ,, 2nd	11 0 0	17 10 0
,, ,, 3rd, &c.	8 0 0	10 10 0
,, Spruce, 1st	9 10 0	10 10 0
,, ,, 3rd and 2nd	7 0 0	8 10 0
New Brunswick, &c.	6 15 0	8 15 0
Battens, all kinds	6 10 0	20 0 0
Flooring Boards, sq., 1 in., prepared, First	0 11 0	0 14 6
Second	0 8 0	0 10 0
Other qualities	0 5 6	0 7 0
Cedar, Cuba ..... foot	0 0 4½	0 0 4½
Honduras, &c.	0 0 4	0 0 4½
Mahogany, Cuba	0 0 4½	0 0 6½
St. Domingo, cargo average	0 0 4½	0 0 6½
Mexican ,, ...	0 0 4½	0 0 5½
Tobasco ,, ...	0 0 5	0 0 6½
Honduras ,, ...	0 0 5	0 0 6½
Box, Turkey ..... ton	4 0 0	13 0 0
Rose, Rio	13 0 0	19 0 0
Bahia	13 0 0	18 0 0
Satin, St. Domingo ..... foot	0 0 6	0 1 0
Porto Rico	0 0 9	0 1 3
Walnut, Italian	0 0 4½	0 0 6½

METALS.	£. s. d.	£. s. d.
IRON—Bar, Welsh, in London ...ton	5 5 0	5 10 0
,, ,, at works in Wales ...	4 15 0	5 0 0
,, Staffordshire, in London ...	5 10 0	6 10 0
COPPER—		
British, cake and ingot ..... ton	70 0 0	72 0 0
Best selected	71 0 0	72 0 0
Australian	82 0 0	85 0 0
Chili, bars	69 0 0	0 0 0
YELLOW METAL ..... lb.	0 0 6½	0 0 7½
LEAD—Pig, Spanish ..... ton	12 17 6	0 0 0
English, common brands	13 2 6	0 0 0
Sheet, English	14 0 0	14 5 0
SPELTER—		
Silesian, special ..... ton	17 12 6	17 15 0
Ordinary brands	17 10 0	17 12 6
TIN—		
Banca ..... ton	98 0 0	0 0 0
Billiton	97 0 0	0 0 0
Straits	98 10 0	0 0 0
Australian	98 10 0	0 0 0
English Ingots	98 10 0	0 0 0
ZINC—English sheet ..... ton	21 0 0	23 0 0

OILS.		
Linseed ..... ton	18 7 6	18 12 6
Cocoanut, Cochin	27 10 0	34 10 0
Ceylon	26 5 0	0 0 0
Palm, Lagos	25 0 0	0 0 0
Rapeseed, English pale	27 10 0	0 0 0
,, brown	26 0 0	0 0 0
Cottonseed, refined	23 10 0	0 0 0
Tallow and Oleine	19 0 0	45 0 0
Lubricating, U.S.	5 0 0	0 0 0
,, refined	7 0 0	13 0 0
TAR—Stockholm ..... barrel	1 2 6	1 2 6
Archangel	0 14 0	0 14 6

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *Noon on Thursdays.*]

ABBOT'S LANGLEY (Herts).—For alterations to the Abbot's House, for Mr. Joshua Walker. Mr. C. P. Ayres, 52, High-street, Watford, architect:—

Dove, Watford	£585 0 0
T. Turner (Limited), Watford	510 0 0
Waterman, Watford	424 0 0

CONTRACTS AND PUBLIC APPOINTMENT.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work, or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Works and Materials	St. Giles' Bd. of Wks.	*Official*	Mar. 11th	xi.
Do. do.	do.	do.	do.	xi.
Supply of Red Deal and Batten Ends	City of London Union	do.	do.	ii.
Cast Iron Pipes	Manchester Corporation	G. H. Hill	do.	ii.
Construction of Aqueduct	do.	do.	Mar. 12th	ii.
Police Court at Dalston	Comrs. of H.M. Works	*Official*	Mar. 13th	ii.
Addition to Bishop Auckland Station	North Eastern Railway	W. Bell	do.	ii.
Cleaning and Painting Stations, &c.	Midland Railway	A. A. Langley	Mar. 14th	xi.
Works and Repairs to Buildings	Comrs. of H.M. Works	*Official*	do.	ii.
Kentish Rag Stone Paving	Southend Local Board	P. Dodd	Mar. 19th	xiii.
Kerbing, Tarpaving, &c.	Lewisham Bd. of Wks	*Official*	do.	xi.
Annual Contracts	do.	do.	do.	xi.
Paving Works	Brentford Local Board	do.	do.	xi.
Tar Paving Works	Hanwell Local Board	E. J. W. Herbert	Mar. 20th	xiii.
Auxiliary Sludge Lifting Power, &c.	Dorking Local Board	G. S. Mathews	do.	xii.
Waterworks	Uckfield Waterwks Co.	H. B. Nichols	do.	xi.
Main Outfall Sewer	Ystradyfodwg, &c., Main Sewage Board	Chatterton & Bazalgette	Mar. 21st	xi.
Postal Stores Buildings, Mount Pleasant	Comrs. of H.M. Works	*Official*	Mar. 26th	xi.
Tarpaving Footpaths	Mortlake Highway Bd.	J. Medworth	do.	xiii.
Broken Granite and Flints	do.	do.	do.	xiii.
Construction of Reservoir	Bideford U.S.A.	*Official*	Mar. 27th	xi.
Making-up Roads	Beckenham Local Bd.	G. B. Carlton	April 1st	xii.
Works and Materials, Chatham	War Department	*Official*	Not stated.	xi.
Metallic Viaduct	Lisbon Municipality	do.	do.	xiii.
Chapel, Lodge, Boundary Fences, &c.	Upton-upon-Severn R.S.A.	E. Day	do.	ii.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Surveyor and Engineer	Brentford Local Board	200*l.*	Mar. 19th	xix.

BALHAM.—For the erection of two shops in the Cavendish-road, for Mr. Isaac Haskins. Mr. A. M. Leach, rchitect and surveyor, Rossiter-road, Balham :—

Hoare & Son	£1,300	0	0
Gatfield	1,175	0	0
Corbett	1,122	0	0
Lang	1,056	0	0
Beare	1,035	0	0

CHARLTON (Kent).—For the pulling down and rebuilding of "The Old White Swan" inn, at Old Charlton, Kent. Mr. John Rowland, architect and Surveyor, Old Charlton, Kent. Quantities by W. Farthing, 46, Strand. W.C.

Patman & Fotheringham	3,750	0	0
Henry Burman & Son	3,239	0	0
Kirk & Randall	3,200	0	0
H. L. Holloway	3,120	0	0
S. J. Jerrard	3,049	0	0
Henry Coombs	3,000	0	0
Holloway Bros.	2,932	0	0
Balsam Bros., Shenton Street, Old Kent-road	2,930	0	0

CHELMSFORD.—For the erection of a pair of cottages on the "Fairfield," for Mr. S. J. Baker. Mr. T. Whitmore, architect :—

A. Roper, Chelmsford	£394	0	0
H. Kennell, Writtle	339	0	0
J. Lummis, Chelmsford	317	1	0
H. Potter, Chelmsford (accepted)	269	0	0

CHELMSFORD.—For the erection of the "Essex Pantechnicon," comprising warehouses, stables, &c., for Messrs. Wesley & Son. Mr. T. Whitmore, architect :—

Mrs. Moss (accepted)	£800	0	0

COVENTRY.—For the erection of Bablake Boys' School, for the Trustees. Messrs. John Giles, Gough, & Trollope, architects. Quantities by Mr. C. H. Goode :—

T. Belham & Co., 155, Buckingham Palace-road	£14,390	0	0
Thos. Turner (Limited), Watford, Herts	14,183	0	0
D. Ellwood & Son, Sandy, Beds	13,800	0	0
Stephens & Bastow, Wandsworth-road	13,399	0	0
Thos. Page, Banbury	13,140	0	0
John Thomson, Peterborough	12,976	0	0
Foster & Dicksee, Rugby	12,633	0	0
John Worwood, Coventry	12,620	0	0
C. Haywood, Junr., Coventry	12,500	0	0
C. Grav Hill, Coventry	12,477	0	0
Geo. F. Smith & Sons, Milverton, Leamington	12,397	0	0
Parnell & Son, Rugby	12,379	0	0
John Inwood, Malvern	12,335	0	0
John Shillitoe & Son, Bury St. Edmunds	12,294	0	0
Edmund Gabbutt, Liverpool	12,187	0	0
John Fell, Leamington	12,175	0	0
W. Bissett & Sons, Birmingham	12,137	0	0
H. Willcock, Wolverhampton	11,895	0	0
Bradney & Co., Wolverhampton	11,725	0	0
Thomas Lowe & Sons, Burton-on-Trent	11,700	0	0
Claridge & Bloxham, Banbury	11,450	0	0

EXTOWN (Somerset).—For building hunting-lodge, Extown, Somerset, for Mr. P. Evered. Mr. W. King Lucas, architect, Rolls-chambers, Chancery-lane :—

Willis & Son, Bridgwater (accepted).	£1,560	0	0

HARROW.—For alterations to "The Ballot Box" public-house, Horsenden Hill, for Messrs. Benskin & Co., Cannon Brewery, Watford. Mr. C. P. Ayres, 52, High-street, Watford, architect :—

Waterman, Watford	£964	0	0
Beechener, Harrow	863	13	5
T. Turner (Limited), Watford*	863	15	0

* Accepted.

HAMPSTEAD, N.W.—For additions and alterations to the "King William IV." tavern, High-street Hampstead, for Mr. W. A. Treadaway. Mr. Albert E. Pridmore, architect, 2, Broad-street-buildings, E.C. :—

Killby & Gayford	£486	0	0
Gould & Brand	469	0	0
E. A. Hudson	430	0	0
W. Evans	409	10	0
Thos. Taylor	377	0	0
J. Crane	364	0	0

KINGSBRIDGE (Devon).—For the erection of parish-room and schools, for the Right Hon. Earl Compton, at Charleton, near Kingsbridge. Mr. Fredk. J. Commin, architect, Exeter. Quantities supplied :—

Gibson, Exeter	£1,422	0	0
Vaustone, Paignton	1,248	0	0
Coles, Exeter	1,230	0	0
Stephens & Son, Exeter	1,160	0	0
Edgecombe & Harry, Blackawton	1,159	0	0
Trevena, Plymouth	1,139	0	0
Ruth & Son, Kingsbridge	985	0	0
Pearce, Kingsbridge	940	0	0
Crocker, Modbury	916	19	5
Rowse, Plymouth	902	0	0
Rundle, Kingsbridge	889	7	0
Blake, Charleton	886	0	0
Fair & Son, Kingsbridge	885	0	0
Tucker & Hutchings, Kingsbridge*	841	2	9

* Accepted.

LLANELLY.—For the erection of new printing-offices, for the *Llanelly and County Guardian* newspaper. Mr. Thomas Arnold, architect, Llanelly :—

Masonry.

D. Hopkins, Llanelly	£1,095	0	0
G. Davies, Llanelly	876	11	0
D. Williams, Llanelly	799	12	4
D. Hughes, Llanelly	780	5	0
Davies & Hopkins, Llanelly	718	18	0
Wm. Bassett, Llanelly*	715	0	0

Carpentry.

D. Edwards, Llanelly	486	0	0
B. Howell & Son, Llanelly	486	18	9
Brown, Thomas & John, Llanelly*	264	0	0

* Accepted.

LLANELLY.—For the erection of five cottages at Andrew-street. Mr. Thomas Arnold, architect, Llanelly.

Masonry.

D. Williams,	£375	0	0
D. Hopkins	453	0	0
D. Hughes	432	0	0
Davies & Hopkins (accepted)	425	0	0
James Lewis	410	0	0
G. Davies	406	0	0
W. Bassett	395	0	0
J. Edwards, Pembrey*	375	0	0

* The rest are of Llanelly.

Carpentry.

T. & J. Brown	£239	0	0
D. Edwards	238	0	0
John Thomas	236	0	0
J. Banks, Dafen*	231	0	0
J. Evans (accepted)	230	0	0

* The rest are of Llanelly.

LONDON.—For the erection of new Middle School for Girls, at Stamford Hill, for the Worshipful Company of Skinners. Mr. Edward H. Burnell, architect, 35, Bedford-row. Quantities by Mr. W. R. Mallett, 28, Great S. Helen's, E.C. :—

Ashby and Horner	£11,100	0	0
J. & J. Greenwood	11,080	0	0
Hall, Beddall, & Co.	10,645	0	0
Scrivener & Co.	10,574	0	0
Patman & Fotheringham	9,473	0	0
Dabbs	8,765	0	0
Godfrey & Son	8,747	0	0
Holloway Brothers	8,694	0	0

LONDON.—For erecting head-quarters and drill-hall in Leonard-street, City-road, for 2nd Middlesex Artillery Barracks Co., Limited. Mr. Chas. J. Higgins, architect. Quantities by Mr. A. J. Beesley :—

G. H. & A. Bywaters	£5,469	0	0
Thos. Heath	5,396	0	0
Colls & Sons	5,295	0	0
Pusey & Lumley	5,225	0	0
J. Grover & Son	5,200	0	0
J. Mowlem	5,167	0	0
Clarke & Bracey	5,143	0	0
Holliday & Greenwood	5,141	0	0
Outhwaite & Son	4,969	0	0
S. R. Lamble	4,853	0	0
W. L. Kellaway	4,849	0	0
Patman & Fotheringham	4,778	0	0
A. White & Co.	4,763	0	0
Mark Gentry (accepted)	4,750	0	0

[Architect's approximate estimate, £4,700.]

LONDON.—For rebuilding the Hall of the Worshipful Company of Brodcers, for Messrs. Morley & Gray, No. 36, Gutter-lane, Cheapside, E.C. Mr. Herbert Huntly Gordon, architect and surveyor, 25, Craven-street, Charing-cross, W.C. :—

Hall, Beddall, & Co.	£4,973	0	0
Hobbs & Co.	4,940	0	0
Colls & Sons	4,926	0	0
Holliday & Greenwood	4,884	0	0
Peto Brothers	4,730	0	0
Ashby & Horner	4,697	0	0
Mowlem	4,625	0	0
Brass & Son	4,573	0	
Wm. Shepherd	4,495	0	
D. Charteris (accepted)	4,478	0	

Excavation and Foundations.

Hall, Beddall, & Co.	£440	0	0
F. & H. Higgs	400	0	0
Peto Brothers	395	0	0
Holliday & Greenwood	380	0	0
Wm. Shepphard	368	0	0
D. Charteris (accepted)	362	0	0

LONDON.—For rebuilding two warehouses, Nos. 77, 78, 79, and 80a, Paul-street, Finsbury, E.C., for Mr. Thomas Griffin. Mr. John Groom, architect, 1, Broad-street-buildings, E.C. :—

Woodward	£3,180	0	0
J. Kent	3,179	0	0
Mattock	3,173	0	0
Grover	3,097	0	0
Holloway	3,087	0	0
Lawrence	3,087	0	0
Killby & Gayford	3,074	0	0
Stimpson	3,066	0	0

LONDON.—For alterations and additions to No. 17, 19, and 21, Bucknall-street, Oxford-street, W., for Mr. H. Brown. Messrs. Glasier & Sons, architects, 6, Spring-gardens, S.W. Quantities supplied :—

Rider & Son	£1,778	0	0
Aiden & Plater	1,718	0	0
C. W. Bovis & Co.	1,617	0	0
B. E. Nightingale	1,397	0	0

LONDON.—For alterations at No. 22, Cross-street, Islington, and covering-in back garden :—

G. Stuart	£1,066	0	0
Gould & Brand	945	0	0
Hunt	943	0	0
McCormick & Sons, 34, Canonbury-road, N. (accepted)	895	0	0

LONDON.—For erecting private residence in Daleham-gardens, Hampstead :—

Allison & Fockett	£2,495	0	0
McCormick & Sons,* 34, Canonbury-road, N.	2,435	0	0

* Accepted subject to alterations.

LONDON.—For alterations, &c., to Nos. 6 and 7, Norton Folgate, E.C. Mr. J. Hamilton, architect :—

Balsam	£444	0	0
W. Shurmur	315	0	0
J. W. Beale	297	0	0
S. Hayworth	279	0	0

LONDON.—For the erection of a workshop in Sarah Anne-street, Walworth, S.E., for Messrs. Green & Walker. Mr. F. A. Powell, architect. Quantities supplied :—

W. Smith	£1,199	0	0
Gregory	1,166	0	0
Burman & Son	1,149	0	0
Castle	1,140	0	0
Downs	1,069	0	0
J. O. Richardson	1,037	0	0
W. & F. Crocker	1,034	0	0

LONDON.—For proposed restoration after fire of No. 293, Strand, for the trustees of Hickson's Estate. Mr. F. R. Ashby, architect, 191, Queen Victoria-street, E.C. :—

Higgs & Hill	£925	0	0
Ellis & Co.	865	0	0
Toms	845	0	0
Stimpson	799	0	0
Killby & Gayford	783	0	0
Adamson	779	0	0

LONDON.—For alterations and additions to No. 7, St. George's-road, Regent's-park, N.W. Mr. Alfred Conder, architect, Palace-chambers, Westminster. Quantities by Mr. Theodore Thorn, 69, Finsbury-pavement, E.C. :—

G. S. S. Williams & Son	£3,090	0	0
W. Scrivener & Co.	2,985	0	0
J. & J. Greenwood	2,899	0	0
R. Lawrance & Sons	2,819	0	0
W. Goodman	2,777	0	0
Edmund Toms (accepted)	2,679	0	0

LONDON.—For the erection of four shops and dwellings over in Mint-street, Southwark, for Mr. Walter Bennett. Messrs. Byrne & Shoebridge, architects, 148, Strand, W.C. Quantities supplied :—

		Extra for shop fronts.
T. Boyce	£2,121	£95
Holliday & Greenwood	2,093	85
Turtle & Appleton	2,075	80
J. Walker	2,068	80
J. Aney	1,990	77
Harris & Wardrop	1,943	83

LONDON.—For warming the school in Horseferry-road, Westminster, on the low-pressure hot-water system, for the School Board for London. Mr. T. J. Bailey, architect :—

T. E. Kershaw	£488	15	0 !
J. W. Smith, Gray & Co.	486	0	0
C. P. Kinnell & Co.	442	10	0
Musgrave & Co.	440	0	0
J. G. Wagstaff	408	0	0
G. Haden & Son	363	10	0
J. Grundy	362	0	0
Eagle Iron and Engineering Co.	350	9	8
Turner & Co.	334	0	0
W. G. Cannon	325	0	0
Hayward, Bros. & Eckstein	325	0	0
Young & Dan	323	0	0
J. & F. May	315	0	0
R. Crane	300	0	0
T. Green & Son	295	0	0
T. Potter & Sons	269	10	0
J. Attwood, Stourbridge*	228	0	0 !

* Recommended by the Works Committee for acceptance.

LONDON.—For pulling down the existing infants' water-closets, lavatories, &c., at the Curtain-road (Shoreditch) School, re-building new water-closets for all departments at a further distance from the school, and carrying out other works at the same school, for the School Board for London. Mr. T. J. Bailey, architect :—

T. Linfield	£856	0	0
Simmonds Bros.	675	0	0
Stevens Bros.	661	0	0
Barrett & Power	649	0	0
O. Dawson	590	0	0
Norris & Luke*	584	0	0

* Recommended by the Works Committee for acceptance.

LONDON.—For removing old water-closets, erecting new water-closets for all departments of the Caledonian-road, Islington, School, and other works, for the School Board for London. Mr. T. J. Bailey, architect :—

Davis Bros.	£598	0	0
T. Linfield	585	0	0
H. G. Heywood	508	0	0
King Bros. & Co.	449	0	0
Stevens Bros.	447	0	0
Simmonds Bros.	437	0	0
C. Coote*	358	0	0

* Recommended by the Works Committee for acceptance.

LONDON.—For removing two iron buildings from the Furnett-road, Plumstead, and re-erecting them in Merton-road, Wandsworth, for the School Board for London. Mr. T. J. Bailey, architect :—

J. C. Wadman	£280	10	0 !
A. M. Deacon	418	0	0
A. Martin	370	0	0
North & Son	300	0	0
J. J. Richards	296	0	0
J. W. Smaler*	264	7	6 !

* Recommended by the Works Committee for acceptance.

LONDON.—For rebuilding No. 52, Featherstone-street, City-road. Mr. H. F. Bacon, architect :—

Hocking	£1,510	0	0
Lawrence	1,210	0	0
Jackson & Todd	1,189	0	0
Sabey & Son	1,169	0	0
W. Shurmur	1,143	0	0
Newton	1,111	0	0

LONDON.—For additions and alterations to No. 172, Brompton-road, S.W., for The Athletic and General Supply Company. Messrs. Brunsden & Henderson, surveyors, 3, Barbican, E.C. :—

W. Dunn	£499	19	0
N. Maskell	492	0	0
Mason & Co.	490	0	0
A. Church	485	0	0
J. Vears & Co.	482	0	0
G. V. Colliver	480	0	0
Norris	415	0	0

LONDON.—For additions, alterations, and new shop-front to No. 36, King William-street, E.C., for Messrs. Charles Straker & Sons, Bishopsgate-avenue. Messrs. Brunsden & Henderson, surveyors, 3, Barbican, E.C. :—

Sage & Co.	£650	1	0 !
S. R. Lambie	489	10	0
Drew & Cadman	425	18	0
J. Vears & Co.	350	0	0
A. Church (accepted)	313	0	0 !

LONDON.—For alterations and repairs to No. 172, Great Titchfield-street, W., for Mrs. Morris. Messrs. Brunsden & Henderson, surveyors, 3, Barbican, E.C. :—

Thomas Aitchison (accepted)	£330	0	0

LONDON.—For the erection of a warehouse, No. 60, Tabernacle-street, for Messrs. Howes Bros. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove :—

Wall Bros.	£1,294	0	0
Woodward & Co.	1,290	0	0
James Smith & Sons	1,290	0	0
Killby & Gayford	1,227	0	0
J. Anley	1,220	0	0
Allen & Sons	1,137	0	0

LONDON.—For erecting Priory Mansion, Kilburn, for Mr. John Harris. Quantities by the architect, Mr. Richard D. Hansom, High-road, Kilburn :—

G. Neal (accepted)	£4,537

LONDON.—For repairs at 16, North-street, Marylebone, for Mr. Lewis Spain. Mr. R. D. Hansom, architect.

Scott	£541
W. Oldrey	375
J. Dare (accepted)	364

LONDON.—For shop front to 199, High-road, Kilburn, for Mr. F. Miklinson. Mr. R. D. Hansom, architect :—

W. Oldrey	£115
J. Green	115

LONDON.—For additional new (curb-roof story and other works, at No. 8, Bryanston-street, Portman-square, W., for Mrs. Wilson :—

J. Haywood, 40, South-street, Park-lane, W. (accepted)	£350	0	0

[No competition.]

PENGE.—For alterations to Penge Station, for the London, Brighton, and South Coast Railway Company. Mr. F. D. Banister, Engineer :—

J. O. Richardson, Albert Works, Peckham (accepted)	£311	0	0

PENZANCE (Cornwall).—For the erection of four villa residences, Lescudjack Estate, Penzance, for Mr. J. P. Cornish. Mr. J. Wm. Trounson, architect, 27, Clarence-street, Penzance :—

Houlson & Co., Penzance	£1,531	2	0
Carkeek, Redruth*	1,496	0	0
Alex. Pooley, Penzance	1,460	0	0
Pellew & Co., Penzance	1,280	0	0
Tredrea & Co., Penzance	1,210	0	0

* Accepted subject to slight modifications.

PENZANCE (Cornwall).—For erecting new shops and premises, 25, Market-jew-street, for Mr. J. H. Beare. Mr. J. W. Trounson, architect, 27, Clarence-street, Penzance :—

Burnett & Walters (accepted)	£850	0	0

SHORTLANDS (Kent).—For the erection of new propagating and forcing houses at "Libiola," May's Hill-road, for Mr. R. S. Archbold. Messrs. Brunsden & Henderson, surveyors, 3, Barbican, E.C. :—

J. Vears & Co.	£147	0	0
J. Denham (accepted)	130	0	0

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